DOCUMENT RESUME

ED 152 493 SE 023 499

TITLE	A Marine Fisheries Program for the Nation.
INSTITUTION	Department of Commerce, Washington, D.C.
PUB DATE	Jul 76
NOTE	92p.; Contains occasional colored pages and shaded charts and graphs which may not reproduce well
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (Stock Number 003-020-00123-8; No price quoted)
EDRS PRICE	MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS	*Conservation (Environment); *Federal Legislation; *Fisheries; *Marine Biology; National Programs; Natural Resources; *Oceanology; Policy; Program Descriptions; *Seafood; Wildlife Management
IDENTIFIERS	Department of Commerce; *National Oceanic and Atmospheric Administration

ABSTRACT

This government publication describing the national plan for marine fisheries is divided into two parts. The first part contains a statement by the Secretary of Commerce, Elliot L. Richardson; the goals for the national marine fisheries plan; a description of the six parts of the plan; and a cost estimate for the program. The goals for the plan are as follows: (1) restore, maintain, enhance and utilize in a rational manner, fisheries and resources of importance to the United States; (2) develop and maintain a healthy commercial fishing industry; (3) strengthen the contribution of marine resources to recreation and other social needs; and (4) insure adequate supplies of wholesome seafood products for consumers. The second part of the publication summarizes the national plan and describes the recommendations of the National Marine Fisheries Service among other things. Recommendations include: (1) manage fish stocks for optimal utilization; (2) develop a sound statistical and scientific data base for the fisheries resources to be managed; (3) mitigate losses of habitat; (4) restore habitats lost or degraded; (5) develop economically feasible enhancement opportunities; and (6) increase United State's Commercial landings by 2.3 billion pounds by 1985 to provide for projected increases in U.S. consumption. (HB)

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A MARINE FISHERIES PROGRAM FOR THE NATION

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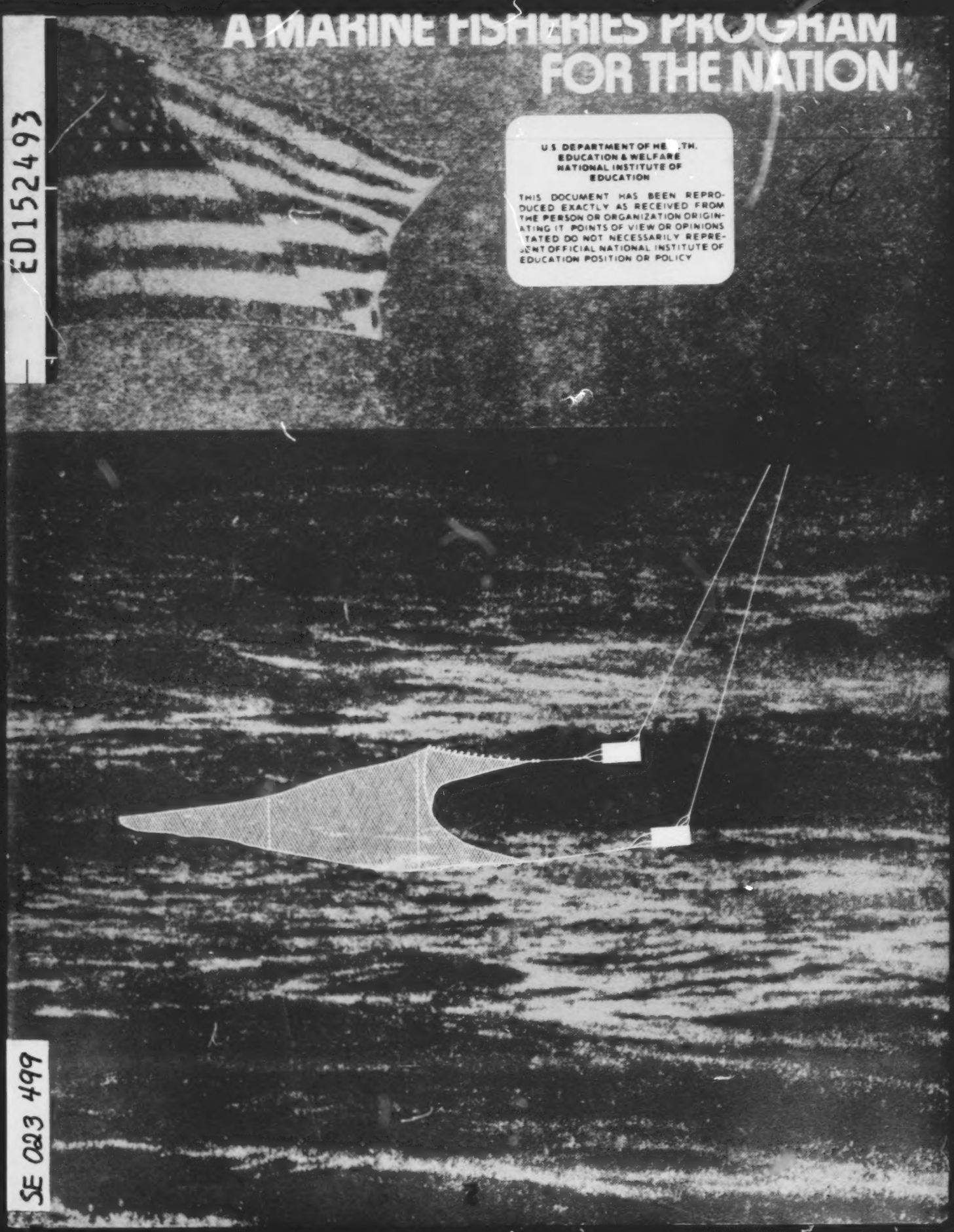

SE 023 499

A MARINE FISHERIES PROGRAM FOR THE NATION

Statement by The Honorable Elliot L. Richardson, Secretary of Commerce

Goals for the future of Marine Fisheries

The Program

- Part 1. Conserve and manage resources
- Part 2. Conserve, restore and enhance fish habitats
- Part 3. Develop and maintain a healthy commercial fishing industry
- Part 4. Strengthen the contribution of marine resources to recreation
- Part 5. Encourage the development of public and private aquaculture
- Part 6. Assure the safety, quality and identity of seafoods

Can the Nation afford the program?

Appendix: The National Plan for Marine Fisheries

U.S. Department of Commerce
Washington, D.C.
July 1976

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402
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STATEMENT

by The Honorable Elliot L. Richardson, Secretary of Commerce

The living resources of the seas and of our large inland waters have always been an important source of food for the Nation. From our earliest days, we have harvested the fish and shellfish that swim and lie in abundance in the high seas, off our coasts, and in our estuaries, lakes and rivers. Our fisheries have also been important for our economy and for recreation. The American fishing industry has a long and noble history, and over the years has made a significant contribution to our economic welfare. And for an increasing number of Americans, fishing has become a popular recreational activity. There are now nearly 30 million marine recreational fishermen in the United States and their number is steadily increasing.

In the years ahead, we may expect the living resources of the oceans to take on still greater importance—not only for our Nation but for the world at large. The world's population is now increasing rapidly, and there are already predictions that the next century will see food shortages of crisis proportions. It is clear that man's ability to nurture, preserve and fully harvest fish and shellfish can play a significant role in his efforts to prevent this threat from becoming a reality.

Thirty years ago, our fisheries seemed inexhaustible. Today we know they are not. The fault lies in large measure with man. Man is a voracious consumer, and modern technology has made it possible for fishing vessels to harvest the living resources of the seas in prodigious amounts. In recent years, many vessels, notably some flying foreign flags, have done so off our coasts and in the adjacent oceans without regard for the capability of fish to continue to renew themselves. As a result, approximately twenty species of fish and shellfish off our coasts have now been seriously depleted and many others are threatened.

We have also been destroying, slowly and inadvertently, many of the habitats and spawning grounds of the fish and shellfish we harvest. The coastal zone of the United States—the areas bordering our coasts and the Great Lakes—contains our seven largest metropolitan centers, almost half of our population, and approximately 40 percent of the American industrial complex. The concentration of people and the proliferation of man's social and economic activities in the coastal zone have had a destructive effect upon many of the living resources that are sustained by the waters of the zone.

Over the past decade, there has been a serious depletion of a vital source of food and a weakening of the American fishing industry, and we must now set to work to restore both our fisheries and our industry. The Congress has provided us with a new opportunity. Earlier this year, it enacted the Fishery Conservation and Management Act of 1976, which the President signed into law on April 13, 1976. The new law represents not only the efforts and concern of the Congress but also those of the Department of Commerce and other interested agencies of the Executive Branch, of State governments, of the commercial fishing industry, of recreational fishermen, and of interested members of the public. The underlying purpose of the Act is to provide a basis in law for a strong national program for the conservation and management of our fishing resources—to prevent the depletion of our fish stocks through overfishing, to rebuild stocks that have been overfished, and to conserve and manage our fisheries so that the Nation may develop their full potential. And with such a program, we can expand the American fishing industry and provide new opportunities for recreational fishermen. The Fishery Conservation and Management Act of 1976 does not stand alone. Over the past twenty years, the Congress has enacted a number of statutes affecting one aspect or another of fisheries management. But the 1976 Act is the most significant fisheries legislation in the

Nation's 200-year history and is the keystone of a national program for our marine fisheries.

The report that follows sets forth the program of the Department of Commerce as the Federal agency that must take the lead in the formulation and execution of a national program. The Department program reflects years of study of the problems of our marine fisheries by the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration and was carried out with the assistance of State Governments, the fishing industry, and recreational and environmental organizations. The fruits of that study are set forth in the proposed National Plan for Marine Fisheries which is appended to this report. I recommend that the reader study this plan to gain a more thorough understanding of our fisheries and their problems. It answers many of the questions that cannot be covered in the Department Program which follows this statement.

The program set out in the report that follows falls into six parts. The first part deals with the actual conservation and management of fisheries. The 1976 Act facilitates the task by creating a fishery conservation zone extending 200 miles from our shores. Within this zone, American vessels will have a preferential right to harvest the optimum yield consistent with the renewability of its fish stocks. Foreign vessels will be permitted to harvest only that portion of the yield that American vessels cannot take. The 1976 Act also establishes eight Regional Fishery Management Councils for the promulgation of regional management plans. The Councils will serve as a mechanism for cooperation and coordination between the Federal Government and regional groupings of States. Conservation and management of our fisheries have many facets but one underlying purpose—to secure the optimum yield from each fishery on a continuing basis.

To a considerable extent conservation and management of our fisheries turn on the protection and preservation of fish habitats. If we cannot maintain a healthy and productive marine environment, there will be few fish. The second part of the Department's program is concerned with this problem. It is essentially an environmental problem and requires the establishment of proper standards, monitoring, and research

The conservation and management of our fisheries and the preservation of fish habitats will in their turn enhance the economic opportunities for our commercial fishing industry. But this will not happen by itself. The industry will require considerable technical and financial assistance. The third part of the Department's program is concerned with how the Federal Government, in cooperation with the industry, can help it to realize the new opportunities. How can the industry best be encouraged to harvest species of fish which it has so far caught only in small amounts, or not at all, or which it catches in significant amounts but discards? How can it be enabled through improved productivity, processing and marketing to sell them in the ever-growing domestic market, or for export?

The fourth part is concerned with marine recreational fishermen. While their immediate concern is the pleasures of recreational fishing, they make an important contribution to the American dinner table. In 1970, they caught approximately 1.6 billion pounds of fish, nearly equivalent to two-thirds of the amount of fish caught by the commercial industry for human consumption. Marine recreational fishermen also need assistance, particularly as they grow in number and increase the pressure on the stocks available for recreational fishing. Recreational fishermen must have access to sufficient fish stocks, and the Department of Commerce must ensure that fishery management plans take their interest into account.

The Department recognizes that over the long term, conservation and management may not be enough. If we are to meet our constantly increasing needs for fish and shellfish, particularly for stocks that are limited and are in high demand, we must devise ways of increasing the production. Aquaculture offers a large opportunity here, and the fifth part of the Department's program focuses on research and development in support of aquaculture to produce fish for both food and recreation.

The sixth and final part of the Department's program is neither glamorous nor esoteric, but it will materially affect the fish and shellfish that reach the American dinner table. This part is concerned with the quality of the fish we consume. The goal is to ensure that the fish offered the consumer is wholesome and meets consistent high standards of quality.

A new national program for our marine fisheries will not be without cost. In FY 1977 the Department of Commerce will spend approximately $100 million on its portion of a national program. The Department's new program envisages an eventual in-

crease by [illegible]5 of some $67 million annually in current dollars. This is a significant amount, but in my judgment the cost is far outweighed by the benefits to our economy. At the present time, the landed value of the fish caught each year by the American commercial fishing industry is approximately $1 billion. The total impact of this activity on the national economy is much greater—in dollars, approximately $6.5 billion, more than six times the value of the landed catch. In numbers of jobs, commercial fishing now provides employment for almost half a million persons, either directly or indirectly. The new program will deepen the total impact by an additional $1.5 billion, and will provide a significant increase in job opportunities for Americans. The new program will also benefit the growing number of marine recreational fishermen who make a significant contribution to household food budgets and indirectly provide increasing employment in supporting industries.

It would be a mistake, however, to think of the benefits solely in terms of the immediate economic impact. Our fisheries are one of the Nation's—indeed the world's—greatest resources, and will become increasingly important as a source of food for man in the decades ahead. We cannot permit the depletion of our fish stocks and the destruction of fish habitats to continue. We must learn to manage this resource so that we may use it to the optimum now and so that future generations may be able to use it and draw even greater yields from it. And we can and must do it in ways which are compatible with the Nation's need to develop other valuable uses of the ocean.

The design of a new program for our marine fisheries is only a beginning. The program must be put into effect, and this is not a self-executing process. It will require careful thought and hard work on the part of the Department of Commerce. And it cannot be done by the Department alone. In this process, the Department must and will look outside for advice and assistance—to State Governments, the commercial fishing industry, the marine recreational fishermen, marine scientists, conservationists, environmental organizations, and others. The Department stands ready to work with all these and invites their help and cooperation.

GOALS FOR THE FUTURE OF MARINE FISHERIES

The National Plan for Marine Fisheries proposed four major goals to serve as guideposts to the future of the Nation's marine fisheries. These goals have guided the Department of Commerce in the preparation of the Program set out in this report. The goals and corresponding parts of the Program are as follows:

GOAL:

Restore, maintain, enhance and utilize in a rational manner, fisheries resources of importance to the United States.

Part 1. Conserve and manage living marine resources.

Part 2. Conserve, restore and enhance fish habitats.

GOAL:

Develop and maintain a healthy commercial fishing industry.

Part 3. Develop and maintain a healthy commercial fishing industry.

GOAL:

Strengthen the contribution of marine resources to recreation and other social needs.

Part 4. Strengthen the contribution of marine resources to recreation and other social needs.

GOAL:

Ensure adequate supplies of wholesome seafood products for consumers.

Part 5. Encourage the development of public and private aquaculture for selected species of fish.

(Developing natural fish resources is dealt with in Part 3.)

Part 6. Assure the safety, quality and identity of the supply of seafoods for U.S. consumers.

PART 1.

Conserve and manage living marine resources.

Until quite recently we were unable to conserve our fisheries resources effectively on a national basis because no comprehensive authority for action existed. Management was exercised by the several coastal states and through voluntary international agreements; but because of the division of jurisdictions these separate authorities were not able to provide the necessary collective control over many widespread and migratory fish stocks. Adequate protection was therefore often difficult, and at times impossible to attain.

Now, three recent Acts of Congress have changed this situation and provided a basis for effective stewardship of the living marine resources in our coastal waters. The most recent and by far the most comprehensive of the trio, is the Fishery Conservation and Management Act of 1976 (The Act). This Act asserts U.S. management authority over stocks of fish and shellfish within 200 miles of the U.S. coast, except highly migratory species, and over anadromous species of U.S. origin and Continental Shelf fishery resources. It establishes guidelines and collective organizational arrangements to ensure their protection and wise use. It breaks new ground by establishing Regional Management Councils to develop management plans for each fishery and gives the Secretary of Commerce authority to approve them and to enforce them beyond the territorial sea. This combination of authorities, by developing a partnership of all interested parties, resolves the key question of the relative roles of the States and Federal Governments, a matter of much concern to both parties in the search for an effective management regime. The management plans for each fishery must specify the optimum yield for the fishery, taking into account commercial, recreational and other relevant user interests. Such plans must therefore consider the public interest as well as conservation needs.

In addition to the Act, the Marine Mammal Protection Act of 1972 establishes a moratorium on the taking of marine mammals (whales, porpoises, seals, etc.) and bans importation of marine mammals and their products, with certain exceptions. The Endangered Species Act of 1973 provides a powerful means to conserve endangered or threatened species of fish. In addition to these acts much earlier legislation affects one or another aspect of managing and utilizing marine fisheries.

Program

The major new task in fisheries which now faces the Department, and indeed all fishing interests, is to ensure effective conservation and management of fishery resources by putting the recent legislation into full effect through workable management programs. In particular, the provisions of the Act must be implemented rapidly and effectively. The Department's immediate responsibility to implement it will be given high priority.

The Department will:

- Integrate the management responsibilities assigned to it by the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Fishery Conservation and Management Act of 1976.
- Establish Regional Councils, provide them with operating guidelines, and support them by supplying scientific information and other appropriate assistance.
- Develop guidelines to assist the Regional Councils in preparing fishery management plans and revisions.
- Work with the Regional Councils in preparing preliminary fishery management plans applicable to foreign fishermen and other management plans required by the Act.
- Establish a permit and fee system for foreign fishermen.
- Develop and put into operation effective procedures for enforcing regulations under the Act in cooperation with the Secretary of Transportation.

- Expand and reorganize research capabilities to meet the greatly enlarged needs created by the Act for scientific, economic, legal and other information.
- Assist the Secretary of State in negotiating foreign access to U.S. coastal fisheries, including renegotiation of existing treaties and establishing governing international fishery agreements, and in negotiating access for U.S. fishermen to underutilized resources within the economic zones of other countries, and cooperative arrangements for high seas fisheries of interest to the United States.
- In cooperation with the Secretary of State propose and support favorable U.S. fishery positions at the Law of the Sea Conference.
- Participate in appropriate international research activities.
- Review the working of the Act and propose changes if required.

Benefits

Effective management will halt overfishing of our coastal resources. It will restore many marine species now depleted, and ensure that they will continue to thrive. This in turn will provide us with a self-renewing supply of as much as twenty or more billion pounds annually of fish for the future growth of commercial and recreational fishing—more than triple the amount now taken by domestic commercial and recreational fishermen from the United States waters.

PART 2.

Conserve, restore, and enhance fish habitats.

Coastal and estuarine areas of our Nation are limited and competition for their use is intensifying. Approximately two-thirds of our important fishery resources are produced there, but their habitat is threatened by dredging and filling, construction, development, disposal of untreated wastes, and other activities of man. Development of the coastal zone must and will continue, but with care its adverse effects on fish habitats and the production of fish may be minimized.

Three things can be done. We can slow down the loss and pollution of habitat using existing legislation to ensure that all actions taken in the coastal zone give full consideration to fish habitat effects. We may, in some cases restore habitats. We can enhance present habitats, making them more productive.

The first step is research to inventory important fish habitats, to improve our understanding of the effects of human activities on the productivity of marine fish habitats, and to determine how undesirable impacts may be modified. The second is to use the results of this and other research to advise agencies which undertake or permit activities likely to affect fish habitats of the probable effects of proposed actions on fisheries, and how they may be modified to decrease losses of habitats and retain or enhance productivity.

Existing legislation, if fully implemented, may be sufficient to provide full consideration to fisheries needs, especially with amendments now under consideration by the Congress. However, because of limited staff and resources, only about 10-15 percent of actions potentially affecting the environment and submitted for the Department's consideration are given significant review and responses. This severely limits the ability to restrain or modify actions threatening to reduce fisheries production in the coastal zone and so reduce their impact.

To restore and upgrade habitats advantage should be taken of a number of Federal statutes, including the Marine Protection, Research and Sanctuaries Act of 1972, the Coastal Zone Management Act of 1972, and the National Wildlife Refuge Administration Act of 1966, for establishing fish habitats as sanctuaries or in other ways preserving them.

Program

The Department will:

- Support amendment of the Fish and Wildlife Coordination Act to clarify its responsibilities under the Act and to ensure fuller coverage of marine fisheries values in environmental decision making.
- Initiate and develop improved mechanisms for close coordination in the review of proposed environmental modifications in cooperation with other concerned agencies.
- Increase review and research capabilities to provide a more complete and informed consultation and review of environmental modifications, with a view to protecting, restoring, and upgrading fish habitats.
- Cooperate with other agencies in programs to inventory and describe fish habitat areas, including those critical to threatened species, and support efforts to establish and manage sanctuaries, refuges, etc., where appropriate.
- Assure that plans developed under the Coastal Zone Management Act provide for adequate consideration of the importance of living marine resources.

The proposed National Plan recommended dedicating Outer Continental Shelf (OCS) lease revenues to fund programs to minimize OCS impacts on fisheries. Dedication of revenues to specific programs reduces overall Federal program flexibility. Funds for such programs will therefore be sought through the regular appropriation process.

Benefits

With these proposals fully implemented, there will be an adequate prior review of every significant coastal and estuarine action that may affect the marine environment. While we cannot estimate quantitatively the extent to which this will reduce losses of fish production, we believe that improved Federal review of permit actions, Federal water resource projects, and state coastal zone programs will substantially increase conservation of fish habitats and consequently strengthen our fish stocks.

PART 3.

Develop and maintain a healthy commercial fishing industry.

The Fishery Conservation and Management Act of 1976 offers for the first time a means to ensure that the abundant fish stocks off our coasts will yield continuing harvests to our commercial and recreational fishermen. It gives domestic fishermen first preference to take these resources, and declares it the policy of Congress to encourage the development of resources now underutilized. Thus it secures the fish resources and the access needed to accomplish the intention previously expressed by Congress in the Fish and Wildlife Act of 1956, the Saltonstall-Kennedy Act of 1954 and the Eastland Resolution (Sen. Con. Res. 11 of 1973) to strengthen the domestic fishing industry.

The growing U.S. demand for seafood offers a natural market for our fishermen. Today, fifty percent more food fish and shellfish is consumed in the United States than in 1960 and the present trend indicates that more than a third as much again will be required by 1985. This demand can be met in a variety of ways from U.S. resources. The

opportunity now exists to restore depleted species such as haddock off New England or Alaska pollock to a full level of production. Our fishermen can enlarge their share of fish such as Atlantic herring and mackerel now being caught mostly by foreign fishermen off our coasts. The harvest of species such as Pacific herring which are not now fully fished could be increased, as could that of species such as mussels which are now almost unused. Technological advancement may enable low cost fish now used for industrial purposes to be transfomed into attractive human food products. In fully developed fisheries, such as those for Gulf shrimp and salmon, the possibility exists of increasing supplies by means of aquaculture, as discussed in a later section.

How should the Department assist industry to take advantage of this opportunity? Providing the resources by improved management under the Act will not be sufficient to enable the industry to overcome many years of subsidized competition. On the other hand, large direct subsidies would be extremely costly and interfere with the principle of the free market. The Department's objectives will therefore be to provide means to enable the private sector to achieve economic efficiency largely through its own support.

Government can best help industry increase its share of the U.S. market for fishery products by instituting and strengthening strong regional fisheries development programs for a sufficient time to enable them to become self-sustaining. These programs, building on present technical, marketing, and financial assistance programs will concentrate on selected high-potential fisheries. They will use the experience of Government-industry cooperative planning funding and action successfully developed recently in New England.

Program

Working with industry, the Department will:

- Identify fisheries that have a high potential for expansion within resource and other limitations, and identify the technical, economic, or social factors limiting their commerical development. This process will take into account the results of the Eastland Fisheries Surveys and the reports on the commercial fishing industry by the General Accounting Office (GAO) and Office of Technology Assessment (OTA), and the National Planning Conference on the Commercial Development of the Oceans.
- Select a limited number of fisheries capable of expansion and design regional programs for their development, comprising activities to improve fishing technology, processing, distribution and the marketing of fish and fishery products, as needed in each case. This will be done in conjunction with regional advisory groups.
- Conduct and monitor the programs.
- Seek re-legislation of the fisheries loan fund (now under moratorium) in order to encourage the development of fisheries not fully utilized by the U.S. industry, and improve productivity aboard fishing vessels. Use Fishing Vessel Obligation Guarantee and Capital Construction Fund programs to foster adequate private capital for vessel construction and financing.
- Continue the present basic support program of providing market outlook reports, economic and statistical information, evaluation of vessel safety and insurance, advice for fishery cooperatives, etc.
- Investigate mechanisms for strengthening the ability of the private sector to increase operations on a self-generating and self-sustaining basis.

The proposed National Plan recommended that an increased proportion of Saltonstall-Kennedy funds be sought to finance this program. The Department recognizes the need for adequate funding of these activities, but believes that it is better to fund programs through regular appropriations so they will be subjected to the financial discipline of the budgetary process.

Benefits

The program provides the opportunity to increase the U.S. production of food fish by a substantial amount in the next decade. An increase of a billion pounds in the U.S. annual catch of food fish over the next decade would increase fishing revenues at dockside level by $400 million annually with a total impact on the national economy of $1.5 billion each year. It could provide up to 30,000 new jobs, 6,000 of these being directly in the fishing industry.

PART 4.

Strengthen the contribution of marine resources to recreation and other social needs.

Recreational or sport fishing is a major aspect of marine fisheries. A declared purpose of the Fishery Conservation and Management Act of 1976 is to promote domestic recreational and commercial fishing. The major contribution of the Department Program to recreational fishing will be in the aggressive implementation of this Act. Estimates based on recent surveys put the number of marine recreational fishermen at almost 30 million. The number is projected to increase by as much as a further fifty percent by 1985. This continuing growth puts increasing pressure on the two most important requirements of recreational fishermen—fish to catch, and access to places to catch them, (beaches, piers, party and private boats, etc.). Provision for the future must address these two needs. Reliable data on the numbers, preferences, catches, effort, and expenditures of recreational fishermen are urgently needed by both resource managers and the supporting industries.

Program

The Department will:

- Ensure that stock assessment and research programs for understanding the ecology and behavior of fish populations needed for fishery management plans give full consideration to species of interest to recreational fishermen.
- Require full consideration of recreational needs in reviewing fishery management plans under the Act.
- Take appropriate actions on a national scale to encourage and support adequate consideration of recreational access.
- Ensure that plans developed under the Coastal Zone Management Act provide for adequate consideration of the importance of access for recreational fishermen.
- Conduct and support surveys to obtain information on numbers of fishermen and their activities (e.g. catches by species and area, fishing effort, conflicts with other users, etc.). These surveys are needed to improve the consideration of recreational needs in management plans, to determine the effects of recreational fishing on fish resources, and to develop a data base to assist the supporting industries.
- Make surveys of commercial activities serving marine recreation to provide improved estimates of their economic significance.

The recommendation in the proposed National Plan to establish a uniform licensing system for marine recreational anglers on a nationwide basis was reviewed by the Department but was believed to be unnecessary at this time. Licensing was considered to be primarily a State responsibility and the possibilities of the most cost-effective and appropriate alternatives for obtaining information needed for management should be examined.

Benefits

Improved conservation and management possible under the Act will provide means to ensure that stocks of interest to recreational fishermen are available to them. This, together with increased access, will provide opportunities for satisfying the growing leisure needs of the U.S. population. As recreational fishing grows, it will add significantly to the Nation's food supply, and increase the economic benefits to the supporting industries.

PART 5.

Encourage the development of public and private aquaculture for selected species of fish.

Agriculture, cultivating plants and raising animals under controlled conditions, has freed man from dependence upon what he could hunt in the wild. Establishment of a comparable system for fish and shellfish—aquaculture—has long been a dream, which in a few cases has become a reality. In the United States, public aquaculture of salmon began a century ago and about one quarter of the Nation's salmon originate in hatcheries. Private aquaculture produces 40 percent of U.S. oysters, half of the catfish and crayfish, and nearly all of the trout for a total of 143 million pounds equivalent to about 3 percent of U.S. landings. These fish are used both for food and recreation. World production from aquaculture is estimated to be about 13.2 billion pounds annually, mostly reared in fresh water.

Many problems must be solved before aquaculture can be expanded to a scale that will contribute materially to future U.S. supply needs. For some species such as oysters, trout, and catfish, aquaculture methods are well known and technical information is sufficient to enable production to be readily increased; but production costs are often high, and to reduce them solutions are needed to long-range problems such as disease control and genetic improvement of stocks. For other species, even basic biological and technological information does not exist or is fragmentary.

Private companies often are unwilling or unable to conduct basic research or development because of the uncertainty of results, the need for specialized facilities and capabilities, and the potential for few patentable discoveries. Since the expected private returns from investment in research and development are low in relation to alternative investments, it is unlikely that adequate research and development will be forthcoming at the proper time if left exclusively to the private sector.

Program

The Department will:

- Increase programs of research and development conducted or sponsored by the Department of Commerce through the National Marine Fisheries Service and the Office of Sea Grant to:
  - ▶ Provide the scientific, technical, legal, and institutional basis needed for the development of aquaculture.
  - ▶ Accelerate the application of research results by information dissemination and extension services.
  - ▶ Provide solutions to long-range problems of currently farmed fish and shellfish such as by developing genetic strains which will grow rapidly on cost-effective diets, are disease resistant and have desirable market characteristics; determining nutrient requirements related to growth and disease resistance; and identifying, controlling, or preventing disease causing mortality to cultured animals.
- Undertake to coordinate the numerous aquaculture research and development activities being conducted by Federal and State Governments, universities, and industry.

Benefits

Aquaculture can be expected to add significantly to the present commercial and recreational harvests of selected species. Public aquaculture, for example, that provides for most of the recreational trout fishing in the United States and more than a quarter of the Pacific salmon catch, will continue to increase. Private salmon aquaculture which currently produces about 1 million pounds, could provide 60 million pounds in a decade. Private production from oyster farms could be quadrupled to about 80 million pounds. Penaeid and fresh water shrimp production which is virtually nonexistent today in the United States could reach a level of 25 million pounds. Supplies of these species are now limited but the demand is high and additional sources are essential if future requirements are to be met.

PART 6.

Assure the safety, quality and identity of the supply of seafoods for U.S. consumers.

The supply of fishery products reaching consumers should not only be diverse and adequate to meet future demands, it should also be safe, wholesome, and of the desired high quality. Because fresh fish spoil more rapidly than most other foods, the quality of seafoods offered for sale and their acceptance by consumers are variable and sometimes low. Public health incidents involving seafoods have occurred with sufficient frequency over past years to disturb public confidence and have led to Congressional proposals for action through some form of mandatory inspection. The need for improved and increased inspection is supported by consumers and by many people in the industry. However, the Department's present voluntary seafood inspection program covers only about 30 percent of the national production and 5 percent of the processing facilities. Federal and state inspection of the remainder is inconsistent and at best cursory.

Program

The Department will:

- Actively support legislation to bring about mandatory surveillance of all seafood plants and products.
- Continue to expand the present DOC voluntary inspection program and integrate it into the national seafood surveillance system when this goes into effect.
- Improve present procedures for examining the safety and quality of fish and fishery products and identifying the nature of the product and its quality to the buyer, to make these procedures more responsive to consumer needs and more cost-effective.
- Support legislation and programs to ensure that the proposed use of chemicals for agricultural, industrial, and other purposes will not result in residue levels in seafoods that will be harmful to consumers.
- Carry out a national education program to inform consumers and the industry about the factors affecting quality and safety in fishery products and of the meaning of Federal identifying marks.

Benefits

Mandatory surveillance will increase the safety and quality of seafood products for the consumer, ensure consistent standards, and reduce waste and loss. It will provide consumers with fresher and more attractive products and by increasing consumer confidence in the quality of the seafood purchased, increase the enjoyment and demand for these products.

CAN THE NATION AFFORD THE PROGRAM?

The six-part program proposed in this report by the Department of Commerce will be phased in incrementally. It is expected that much of it will be implemented over the next five years, but the program will not be in full flower until 1985. The program will require a moderate increase in the Department's expenditures for its activities relating to our marine fisheries. However, the benefits to the Nation will far outweigh the costs of the Department's program.

In fiscal year 1976, which ended on June 30, 1976, the Department of Commerce spent approximately $76 million on fisheries management and related activities. In FY 1977, which will be the first full fiscal year in which the Department will administer the Fishery Conservation and Management Act of 1976, the Department will spend approximately $100 million for the program set out in this report. With full implementation of the program by FY 1985, the proposed level of annual expenditures would rise to approximately $167 million. The following table shows the anticipated expenditures in FY 1977 and by FY 1985 for each of the six parts of the Department's program. The figures given, all in 1976 dollars, are general planning figures and will be reviewed and refined in the budgetary process.

While the Department of Commerce is the leading Federal agency in the execution of a national program for our marine fisheries, other Federal agencies—such as the Coast Guard, the Department of State, the Department of the Interior, and the Environmental Protection Agency—have important roles to play. Additional expenditures will be incurred also by these agencies.

We anticipate that the total Federal cost of a national program will be reduced significantly, by the fees to be paid to the general treasury by the owners or operators of foreign fishing vessels for permission to catch fish within the 200-mile conservation zone established by the Fishery Conservation and Management Act of 1976. A schedule of fees has not yet been established, and there

Annual Funding of Proposed Department of Commerce Program [1/]

($ in millions)

Part of Program	FY 1977	FY 1985	Total Increase
1. Resource Management	65	86	21
2. Habitat Conservation	17	36	19
3. Fishing Industry	5	12	7
4. Marine Recreation	3	10	7
5. Aquaculture	7	13	6
6. Seafood Products [2/]	3	10	7
Total	100	167	67

1/ The bulk of the funds are for fishery programs administered by the National Marine Fisheries Service but some related programs of other elements in NOAA, particularly the National Ocean Survey and the Office of Sea Grant are included.

2/ Includes Trust Fund receipts from plants participating in the Department Voluntary Inspection Program which are estimated to amount to $1.7 million in 1977 and, on full implementation of the program to rise to $4.7 million. The final figure will depend on the extent of industry participation.

has as yet been no experience with this provision of the 1976 Act. But we may say generally that these receipts can be substantial—rising into the tens of millions of dollars.

The anticipated costs of the Department's new program are modest. The benefits to the national economy, however, are great. In 1973, the dockside value of the fish and shellfish caught by the American fishing industry was $1 billion. But this is not the final measure of the industry's impact on the national economy. Fish must be processed, stored, transported, and sold. And the whole chain—from the construction of the fishing vessel to the actual consumption of fish—is supported by a large number of other industries. In dollars, the industry's total impact on the economy was approximately $6.5 billion. In terms of jobs, commercial fishing employed directly some quarter of a million persons and indirectly accounted for the employment of an additional half million persons. The Department estimates that its new program will deepen the dollar impact by an additional $1.5 billion and will provide, either directly or indirectly, an additional 30,000 jobs.

The new program, by expanding Federal assistance to marine recreational fishermen, will also result in economic benefit. Marine recreational fishing makes an important contribution to American household food budgets. In 1970, marine recreational fishermen caught 1.6 billion pounds of fish, equivalent to two-thirds of the amount of food fish caught by the commercial industry for human consumption. Data on the economic benefits of recreational fishing are less certain, but marine anglers' direct expenditures for goods and services are estimated to have been $1.2 billion in 1970. Indirect economic impacts would probably be more than twice this amount.

Marine fisheries as a whole are therefore generating some $10 billion annually in the economy. Future growth in our commercial and recreational fisheries could add several billion dollars more.

There are large benefits that cannot easily be reduced to economic terms. The living resources of the oceans have been and will always be an important source of food for the Nation. In the years ahead, we may expect these resources to take on still greater importance—not only for the Nation but for the world at large. The world's population is now increasing rapidly, and there are already predictions that the next century will see food shortages of crisis proportions. It is clear that man's ability to nurture, preserve, and properly harvest fish and shellfish can play a significant role in his efforts to prevent this threat from becoming a reality.

There are still other intangible benefits. If we can increase the opportunities for marine recreational fishing, we will enhance the pleasure of the recreational fisherman. And if we can ensure that the fish and shellfish that reach the American dinner table are wholesome and consistently meet high standards of quality, we can provide the American consumer with a degree of protection that he has never had before. Above all, we will be able to pass these great resources on to coming generations in a healthy and productive condition. Such benefits cannot be measured, but they affect tens of millions of Americans.

APPENDIX
TO A MARINE FISHERIES PROGRAM
FOR THE NATION

THE NATIONAL PLAN FOR MARINE FISHERIES

A composite expression of the views of national fisheries interests, as prepared by the Director of the National Marine Fisheries Service.

The Plan presented on the following pages was submitted to the Secretary of Commerce in December 1975 as a document containing views of many people in fisheries on the future needs and opportunities for the Nation's marine fisheries.

Developing the Plan fostered a nationwide discussion on many aspects of fisheries; especially those of conservation and management. Many of the conclusions were subsequently embodied in the Fishery Conservation and Management Act of 1976 which was enacted into law in April of that year. As a result, the Act closely parallels the recommendations made in the Plan and provides the implementation of the management recommendations. Each of the major management recommendations listed on page 26 is followed by a reference to the sections of the Act which most directly correspond to it.

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
October 1975

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National Marine Fisheries Service

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FOREWORD

Phase 1 of the National Plan for Marine Fisheries is the product of a truly national effort in which the National Marine Fisheries Service was the catalyst. The plan is a composite expression of the views of the Nation's fisheries community, in all of its parts, with regard to the need to enlarge and maintain for coming generations the fisheries resources that are so essential to the Nation's health and prosperity.

This phase is simply a statement of scope, policy and objectives, not a total solution. It is the first essential step toward action. As a document it has, I think, landmark qualities. The plan emphasizes priorities, but it leaves room for choices. The plan has breadth—it covers every aspect of fisheries activity from the catching to the eating—yet it focuses on issues. The plan speaks to enduring national goals, but its target is 1985, and its implementation is soon to begin. The plan seeks to resolve longstanding problems of management and coordination at national, regional, State, and local levels, but it encourages evolutionary change. At every stage decisions were made after careful weighing of comments, irrespective of source. We expect some disagreement with the recommendations. I take the responsibility for what appears.

The National Plan dictates action. But not all actions should come at once. In certain fields—improving management, utilizing resources, attacking complex problems of environmental degradation—priorities are high. Some are distressed that the implementation section is not more pointed, precise, and meaty. Who can commit at this moment irrespective of the merits of the proposed actions, the Federal or State Governments—or any other entity for that matter—to a course of action and the resources to support it? Nothing would please me more than to have such pledges included in this document. But it is premature for that when so many must and will be involved.

Hundreds of people of diverse background and interest from all parts of the coastal United States labored long and hard for this common cause—a meaningful future for marine fisheries of this country. They demonstrated they care. Those who contributed their judgment and expertise to the planning process have my thanks, and I hope that developments of the coming decade will bear testimony to their collective wisdom.

In taking the next logical step—agreeing on implementation—we must join forces. The hour is late. The need is great. I pledge you our active participation and I sincerely seek yours.

Robert W. Schoning
Director
National Marine Fisheries Service

THE NATIONAL PLAN IN SUMMARY

Phase I of the National Plan for Marine Fisheries is a comprehensive outline of actions considered necessary to assure the growth and vitality of the Nation's marine fisheries resources and their enlightened use for the Nation's well-being.

The plan was developed by National Marine Fisheries Service (NMFS) on the recommendation of the National Advisory Committee on Oceans and Atmosphere (NACOA). Around 3,000 people representing other Federal agencies, States, industry, recreational, environmental and consumer interests contributed opinions and suggestions on a series of drafts through meetings, interviews or correspondence. It was based on the assumption that the United States will have jurisdiction over fisheries resources within 200 miles of its coastlines, although the need for a plan is vital in any case.

It presents recommendations for achieving four broad national goals. The target date is 1985. The recommendations were developed by the National Marine Fisheries Service with the advice and assistance of persons representing virtually every aspect of the national interest in the conservation of marine fisheries resources, their use for food and recreation, and their contributions to the Nation's economy.

The plan is not an official commitment to undertake or pursue any of the recommendations contained therein. It does represent an effort to bring together, at a critical time in the history of the marine fisheries, the best and most constructive thinking in future courses of action. The extent and speed of implementation of the recommendations will depend, however, on the importance attached to them by the Congress and the Executive Branch as they consider them in relation to other national needs.

The Need for Positive Action

The condition of the U.S. marine fisheries, especially when considered with regard to the probable future demands upon them, has stirred deep concern. To problems of long standing have been added new problems of which the Nation is becoming acutely aware. Uncertainty and anxiety are produced by trends such as these:

- Many important U.S. marine fish stocks are becoming depleted or threatened as a result of increased fishing.
- The rapid growth of foreign fishing off U.S. coasts in recent years is an important factor in the depletion of marine resources.
- Increasing deterioration of marine and estuarine environments threatens the future of U.S. fish stocks.
- The growth of marine recreational fishing is increasing the demands on fisheries resources, and its future needs will be a major factor in fisheries management.
- While the world catch has increased in response to growing demands for fishery products, the U.S. catch has remained static.
- Large segments of the U.S. harvesting industry are in a chronically depressed state; overall productivity has remained level or decreased.
- U.S. consumption of fishery products has nearly doubled in the last twenty-five years; the increase being met by a fourfold increase in imports.

The National Goals

The recommendations of the National Plan are designed to move U.S. marine fisheries toward achievement of four broad goals touching major elements of the national interest in such resources. The goals, which were identified in the beginning of the planning process, are:

- To restore, maintain, enhance, and utilize in a rational manner fisheries resources of importance to the United States;
- To improve the contribution of marine resources to recreation and other social benefits;
- To develop and maintain healthy commercial and recreational fisheries industries; and
- To increase the supply of wholesome, economically priced seafood products to the consumer.

These goals are regarded as fixed and constant points of reference for future decisions in the realm of national policy and priority.

The Recommendations

At the heart of the National Plan are five major recommendations, each the core of a number of supporting recommendations designed to achieve the plan's goals.

The major recommendations are concerned with (1) the management and conservation of marine fisheries; (2) the conservation and enhancement of fish habitats; (3) strengthening the commercial fishing industry; (4) improving marine recreational fishing opportunities; and (5) meeting projected consumer demands for fishery products.

The major and supporting recommendations follow:

1. Establish policies, plans, and institutional management arrangements to restore, maintain, and enhance fish stocks within U.S. jurisdiction, to insure the equitable allocation of these stocks, and to assist in the conservation of stocks of importance to the United States outside U.S. waters.

- Manage fish stocks for optimum utilization.
- Establish state and Federal institutional arrangements for management of domestic fisheries resources.
- Insure that interested parties have opportunity to advise on the needs for fisheries management plans and the contents of them.
- Develop a sound statistical and scientific data base for the fisheries resources to be managed.
- Improve and expand Federal and state surveillance and enforcement capabilities as needed.
- Establish a mechanism which would permit limiting entry into fisheries where biological, economic and social evidence shows such action to be appropriate.
- Establish a mechanism for allocating the harvest, providing for regional variations as appropriate.
- Develop a funding system to pay management costs.
- Provide continued opportunity for U.S. fishermen to participate in fisheries for highly migratory species wherever they are found, to have access to areas of historical U.S. fishing that may be within the jurisdiction of other nations, and to participate where appropriate in fishing for underutilized species within other nations' jurisdictions, and not subject historically to U.S. fishing.
- Strengthen international arrangements with respect to salmonid stocks of U.S. origin and other fish stocks shared with adjacent nations.

2. Reverse the downward trends in quantity and quality of fish habitats by minimizing further losses and degradation of these habitats, restoring and enhancing them where possible, and establishing sanctuaries where necessary, while recognizing other compatible essential uses of fish habitat areas.

- Improve the consideration given to fish habitats in decisionmaking processes.
- Mitigate losses of habitat where possible, restore habitats lost or degraded, and develop economically feasible enhancement opportunities.
- Establish sanctuaries, reserves, or other systems where necessary to protect critical fish habitats, fish production, and associated recreational and esthetic values.
- Improve the quality, and increase the dissemination of information required for fish habitat conservation activities.

3. Strengthen the U.S. commercial industry to enable it to provide increased supplies at competitive prices.

- Establish an effective fisheries development program to enable the U.S. commercial fishing industry to enlarge its share of markets through increased productivity, lower costs, and increased acceptability of fishery products to the consumer.
- Design fisheries management plans and revise unnecessarily restrictive regulations to permit increased industry efficiency and lower production costs.

4. Improve opportunities for participation in marine recreational fishing.

- Expand and accelerate research needed for the improved management and use of recreational fisheries, and improve the distribution of information thus obtained.
- Increase the amounts and kinds of fisheries resources available for recreational use.
- Increase access for anglers and recreationists to shorelines, waters, and fish.
- Determine the needs of commercial enterprises for assistance in developing access, facilities, and services upon which marine recreational fishermen depend.

5. Ensure the availability to the U.S. consumer of supplies of wholesome fishery products from U.S. sources sufficient to provide for projected increases in consumption.

- Increase U.S. landings by 2.3 billion pounds by 1985 to provide for the projected increases in U.S. consumption.
- Encourage the development of public and private aquaculture for selected species of fish and shellfish.
- Assure the wholesomeness and identity of fishery products to U.S. consumers through a comprehensive program of inspection of U.S. and foreign production facilities and supplies.

Implementation of the Plan

Phase I of the National Plan recommends directions of necessary action. Phase 2, implementing the recommendations, is a following and separate task that requires new management techniques and better state, regional, and national coordination. Implementation is the responsibility not just of the National Marine Fisheries Service, but of many segments of Federal and State Governments and of industry. It therefore depends for success on a high degree of national commitment and wide public understanding and support.

Implementation will not mean that actions go forward concurrently on all fronts. The timing and course of action on different recommendations will depend on the state of information available for the next step, and the ongoing actions in each case. Congress has already begun implementation of certain of the management recommendations through a bill designed to extend U.S. fisheries jurisdiction, and NOAA has kept pace by establishing a task group to coordinate the development of detailed plans for establishing a management regime. Studies by the interstate marine fisheries commissions under the Eastland Resolution are also under way. In addition, NMFS will make a follow-up study to detail specific implementation steps needed, and to estimate their costs. In doing this NMFS expects to communicate with many of those who provided comment and advice during the drafting of the plan.

THE NEEDS AND THE OPPORTUNITIES

A national plan is needed as a design for the future of the marine fisheries of the United States.

Phase 1 is an outline of scope, policy and objectives developed by the National Marine Fisheries Service. It was prepared with the advice and assistance of hundreds of persons closely associated with marine fisheries or interested in the future of fisheries resources as they contribute to the Nation's food supplies, its recreational opportunities, and its economic strength.

The plan does not represent an official commitment to implement the recommendations contained therein. It does constitute, however, at a critical moment in the history of the Nation's fisheries, a strong invitation to constructive action.

The Value of Living Resources

The Nation owes its existence to the sea, which in the earliest days provided security and sustenance and encouraged the beginnings of industry and commerce. In this later age—an age of growing populations and growing demands for food—the sea remains both a frontier and a storehouse of living resources of immense value. Now, in the last quarter of the twentieth century, the Nation has an opportunity to examine, totally, its position with regard to the future of that heritage.

The marine resources available to the United States are numerous, and their ultimate capacity to contribute to the Nation's strength and well-being is, even today, not fully realized. They are not, however, inexhaustible, as instances of depleted fisheries stocks attest. Fortunately living marine resources are renewable, and with proper protection and cultivation, they comprise a continuing vital part of the Nation's natural wealth.

The central question is how the United States can best preserve, enlarge, and use judiciously these natural resources of such fundamental importance. A new urgency is given this question by the prospect that the Nation soon may have exclusive jurisdiction over marine resources within 200 miles of its coastlines—jurisdiction over one-fifth of the world's marine fish stocks. The opportunities never have been so great, the responsibilities so pressing.

How Large Are the Problems?

The National Plan is a product of needs and forces long gathering.

Virtually every segment of the U.S. marine fisheries lives with problems, some local, some related to broad economic or other conditions, some stemming from national or international circumstances too far-reaching for any segment to handle alone. Yet the basic problems are not of recent origin. Some have existed so long that they have come almost to be accepted as characteristic of the fisherman's chancy and uncertain ways of life. Problems have arisen from a variety of causes, but behind all is a pervasive uncertainty about the continued existence of fisheries resources in the face of the intense competition for them.

The situation was described succinctly in 1972 by the National Advisory Committee on Oceans and Atmosphere (NACOA) in its first annual report to the President and the Congress. In introducing its discussion of the need to rehabilitate United States fisheries the Committee said:

> Fishermen have long contended with one another. Competition for a common resource has set the commercial fisherman against the sportsman, one segment of the industry against another, one locality of the Nation against another, one nation against another. But now, as a consequence of technological improvement and over-capitalization, there exists the capability to fish to extinction. Awareness of this dreadful possibility is becoming universal...

This awareness certainly is universal in the U.S. fisheries community. The conditions of the various elements have been discussed and documented in a number of major conferences and studies of the last decade.* The trends and conditions of particular concern are these:

- Many important U.S. marine fish stocks are becoming depleted or threatened as a result of increased fishing.
- The rapid growth of foreign fishing off U.S. coasts in

* Reference is made particularly to the University of Washington Conference on the Future of the U.S. Fishing Industry, 1968; the reports of the Commission on Marine Science, Engineering and Resources, 1967-1969; and the Technical Conference on Fishery Management and Development of the U.N. Food and Agriculture Organization, 1973.

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recent years is an important factor in the depletion of marine resources.

- Increasing deterioration of marine and estuarine environments threatens the future of U.S. fish stocks.
- The growth of marine recreational fishing increases the demands on fisheries resources, and its future needs will be a major factor in fisheries management.
- While the world catch has increased in response to growing demands for fishery products, the U.S. catch has remained static.
- Large segments of the U.S. harvesting industry are in a chronically depressed state, and overall productivity has remained level or decreased.
- U.S. consumption of fishery products has nearly doubled in the last twenty-five years, the increase being met by a fourfold increase in imports.

These fundamental problems persist, and there is little reason to hope that they will somehow rectify themselves. Action suited to the times will be required to solve them and to realize fully the opportunities inherent in cultivation of the Nation's living marine resources.

A Plan to Achieve National Goals

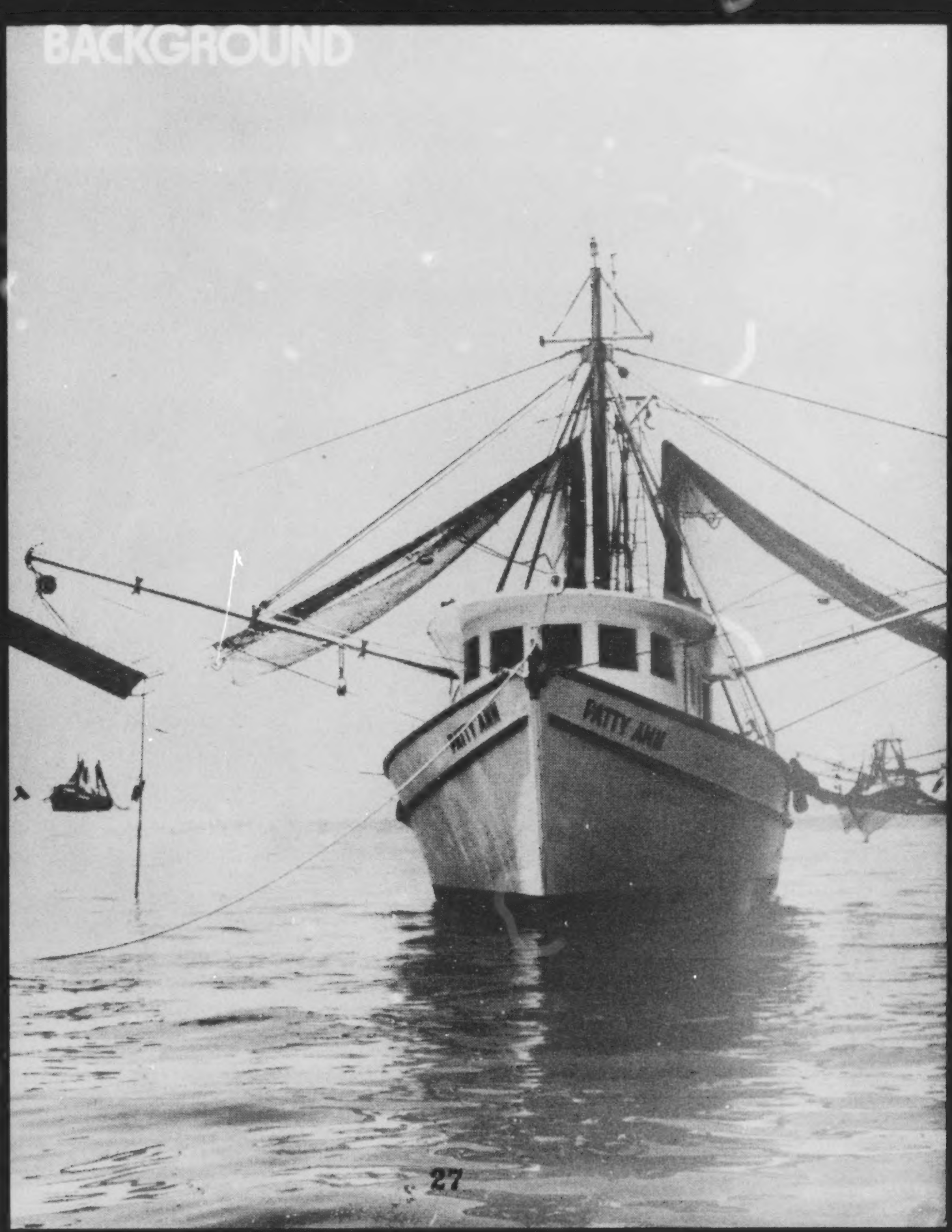
As a design for the future, the National Plan sets courses for long term action to remedy such problems.

The plan proposes specific measures to move the marine fisheries toward achievement by 1985 of four broad goals touching major elements of the national interest in such resources. The goals, which form the theme of the plan, are:

- To restore, maintain, enhance, and utilize in a rational manner fisheries resources of importance to the United States.
- To improve the contribution of marine resources to recreation and other social benefits.
- To develop and maintain healthy commercial and recreational fisheries industries.
- To increase the supply of wholesome, economically priced seafood products to the consumer.

Development of a plan was urged in 1973 by the National Advisory Committee on Oceans and Atmosphere (NACOA), which suggested that the task be undertaken by the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce. By the end of the year a small full-time staff from the National Marine Fisheries Service (NMFS) had been assigned to the project under the guidance of two steering committees, one internal and the other a subcommittee of the Marine Fisheries Advisory Committee (MAFAC) with representation from NACOA. As a planning guide, these committees instructed the staff to proceed on the assumption that the U.S. fisheries jurisdiction would soon be extended to 200 miles from the coast. However, it recognized the vital need for such a plan even if such an action were delayed or not taken.

The process of planning involved wide consultation inside and outside government. Goals, problems, issues, and possibilities for action were considered in more than one hundred public meetings in some fifty locations. These were conducted with the cooperation of Sea Grant universities, the Marine Advisory Service, the interstate marine fisheries commissions, and state agencies. Participants included more than 3,000 persons representing virtually every aspect of general concern—fishermen, commercial and recreational; state and Federal fisheries officials; representatives of fisheries industries; spokesmen for environmental and recreational groups; and persons from universities and research laboratories. In three extensive review papers of August 1974, and April and June 1975, proposals were submitted to public and professional examination and hundreds of written comments were received. The opinions expressed were, expectedly, diverse. Not all who were consulted, in meetings or otherwise, will support all of the recommendations as they are presented. The plan nevertheless constitutes a thoroughly considered response to the views and suggestions contributed so generously.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THE STATUS OF U.S. MARINE FISHERIES

Most of the world's marine fisheries resources live in the temperate and sub-arctic shelf areas of the oceans. Almost a fifth are found in waters within 200 miles of the U.S. coasts.

Yet, with such riches at hand, the United States has not devised truly national approaches to harvest and use. The Nation's unmatched technological capacities have not been applied uniformly to the fisheries. Nor has the Nation made the important decisions in the fields of fisheries law, regulation, and national policy needed to protect its resources and realize their potential. Perhaps the greatest irony is that, although the United States is rich in resources and the capability to develop them, other countries have supplied its growing needs for fishery products.

To understand this paradox one must examine the condition of the fisheries as a whole—how the condition came about, and how economic or other factors affect the fisheries generally or in their separate parts. Such an examination covers four areas of national concern:

- The condition of fish stocks and their habitats.
- The nature and economic value of U.S. commercial fishing.
- The position and probable future of marine recreational fishing.
- The contribution of marine fisheries to the U.S. food supply.

The Condition of Fish Stocks in U.S. Coastal Waters

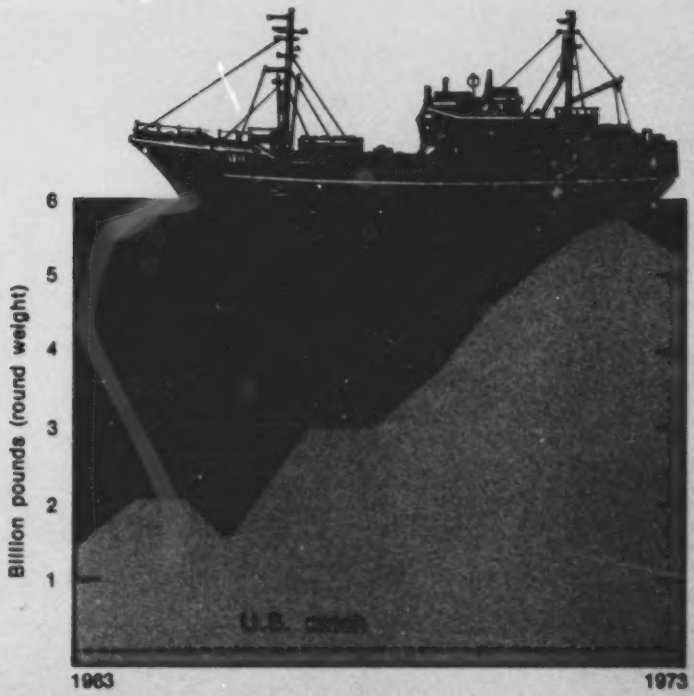
It is estimated that the stocks of fish off the U.S. coasts are capable of yielding 20 to 40 billion pounds annually on a sustained basis.

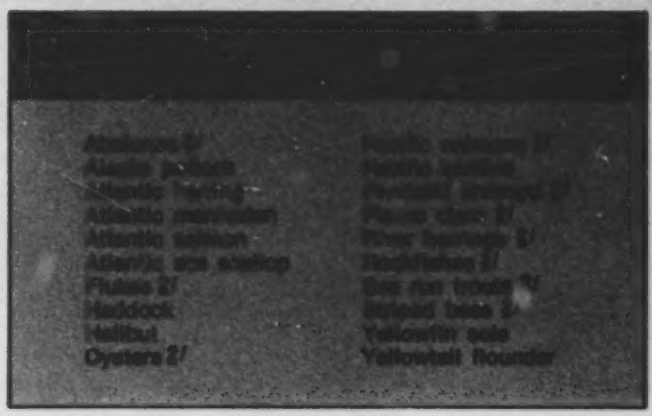
This wealth of fisheries resources off the U.S. coasts has attracted a vast influx of foreign fishing in the last fifteen years. Due in part to the lack of comprehensive management authority and the absence of effective management programs, meaningful control over fishing has been difficult, often inadequate, and at times absent altogether.

By 1972, the foreign catch in U.S. coastal waters had reached an annual level of 7.9 billion pounds.* Of this total, Japan took about 4.4 billion pounds and the U.S.S.R. about 2.4 billion pounds. Since 1938, one third of the increase of all Japanese catches and one-fifth of the U.S.S.R. increases have come from fishing operations within 200 miles of U.S. coastlines. An example of the trend of increasing foreign catches from waters of the U.S. coast is illustrated in Figure 1. The result of such rapidly growing catches has been a drawing down of valuable fish stocks to levels low enough to reduce production and, in a number of cases, to threaten their survival.

* Catches and landings are reported internationally in millions of metric tons, but in the United States in millions or billions of pounds. It was decided to use the pound as the unit of measure in the National Plan since this unit is widely used and understood in the U.S. fishing and processing industries. One million metric tons equals 2.2 billion pounds.

Figure 1. Estimated U.S. and foreign catches of groundfish and herring off Alaska, Washington, Oregon, and California





1/ Some stocks have been so reduced through overfishing, or any other man-induced or natural cause, that a substantial reduction in fishing effort must be achieved so that stocks can replenish themselves to produce optimum yield.
2/ Not all stocks depleted.

Not only are many important stocks of fish already seriously deteriorated, but these changes in abundance may produce serious changes in ecological relationships that we cannot now foresee. Marine ecosystems are complex, and our knowledge of them is limited, but we can see how overfishing creates additional dangers.

For example, on many fishing grounds a variety of species exists in the same place at any given time. A trawl fishery seeking a particular target species will, in addition, catch many of the others, and where there is overfishing the other species will also decline in abundance. A prime example is the catch of Pacific halibut by the pollock fishery in the Eastern Bering Sea, an incidental catch so high as to have caused an alarming decline in halibut, despite decades of joint U.S.-Canadian management of the halibut on a single species basis.

In the Northwest Atlantic Ocean, the original decline of the haddock was caused by massive pulse fishing of the species. It has not recovered, primarily because of the incidental harvest of haddock by foreign vessels now seeking cod and red and silver hake.

Effective management requires that the optimum yield for the total biomass be considered in addition to consideration of optimum yields for individual species. Management of the total biomass can permit effective control of the incidental catch and make possible maintenance of the ecosystem in its most productive state.

Attrition of Fish Habitats

Fish habitats in the U.S. coastal and estuarine waters continue to be lost to physical encroachments and the effects of pollution.

Many marine species are dependent upon such areas for their existence, but the environments they need are slowly but surely being diminished by dredging, filling, and other modifications of shorelines. Information on the impact of these changes is fragmentary and incomplete, but much available evidence shows that the cumulative effect of such changes acts to reduce the stocks of fish upon which commercial and recreational harvests depend.

Two examples illustrate the kinds of changes that are occurring.

The first relates to dredging and filling of estuaries. Between 1950 and 1969, 4 percent of the Nation's habitat areas were lost through such action. The figure in itself may not seem high but, if followed by others of similar amount over the next period, the cumulative losses could become formidable. Further, the loss of 4 percent is only a national average. On the Southwest Pacific coast, the loss was three times this—12 percent over the same period. As a more localized instance it is estimated that the State of Connecticut has lost two-thirds of its original 27,000 acres of wetlands since 1900. Fairfield county in that State lost 45 percent of its wetlands in the ten years preceding 1967.

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The second example is the accumulating impact of pollution on shellfish environments. In the five years between 1966 and 1971, the area closed to shellfish harvesting because of environmental pollution increased by 6.4 percent.

The Nature and Value of the U.S. Commercial Fishing Industry

The U.S. commercial fishing industry consists of 130,000 fishermen, 1,800 processors, 1,200 wholesalers, and 2,000 importers/exporters, plus frozen and canned food distributors and retail, restaurant, and institutional buyers. It is largely composed of many small enterprises spread along the coastal states and throughout much of the interior of the country. An estimated 80 percent of the fishing craft in the United States are individually owned; 84 percent are under 5 tons. Small-unit operation also is characteristic of the processing industry. Comparatively few large companies exist. About 42 percent of the processing plants have annual sales of less than $100,000. Only 17 percent have sales over $1 million and only 2.4 percent (forty-three plants) have sales of over $10 million. The few companies that may be considered giants in the fish processing industry are quite small when compared to large companies in other areas of food processing.

World landings have tripled since 1948, although the increase has dropped off somewhat since 1971, largely due to the tremendous decline in landings of Peruvian anchovy. U.S. commercial landings rose in the aggregate only slightly since 1948, from 4.3 billion pounds to 4.7 billion pounds in 1973. A gradual rise to a high of 5.3 billion pounds in 1962 was followed by a decline to the 4.7 billion pound level. Despite a rising demand in the U.S. for fishery products, U.S. fleets—with the exceptions principally of the shrimp, tuna, king crab, salmon, and menhaden fleets—generally have remained undeveloped or have deteriorated. Processors have had to rely more and more on imports to meet increasing demands.

In the last fifteen years, other nations with large and efficient fleets—many subsidized and carrying the most technologically advanced equipment—have greatly

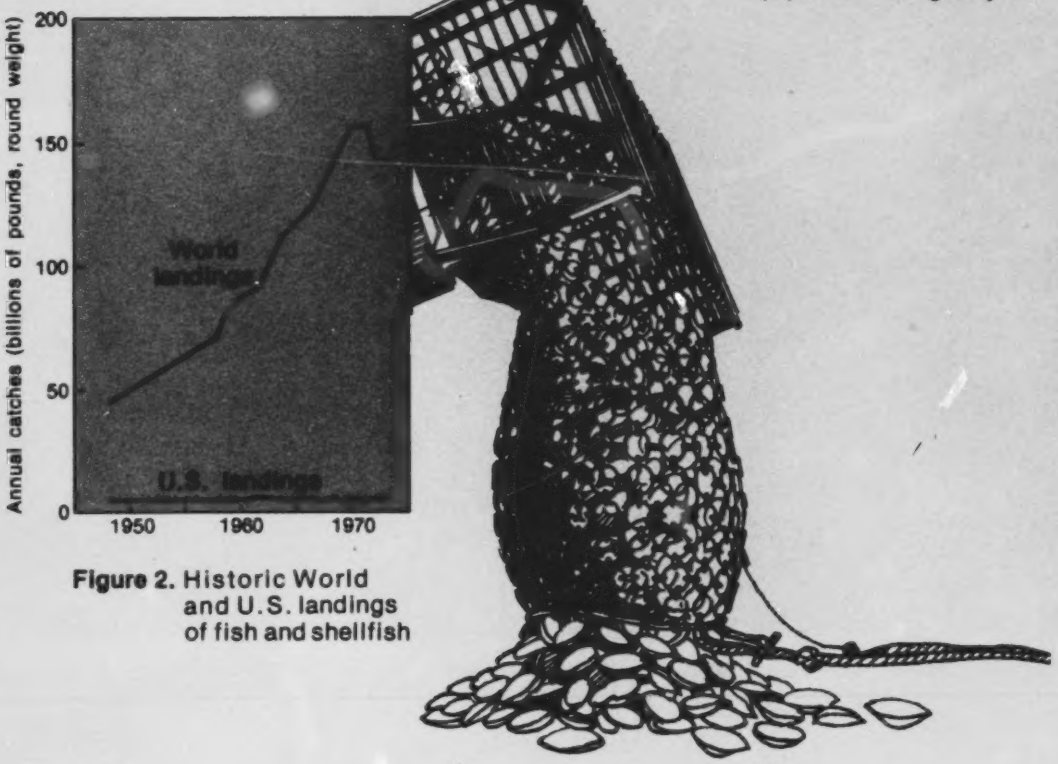


Figure 2. Historic World and U.S. landings of fish and shellfish

increased their fishing efforts. Gains recorded by six leading fishing nations are reflected in data published by the United Nations Food and Agriculture Organization (FAO). The gains (the totals including shell weights) were these: *Japan*, from 18.1 to 22.4 billion pounds; *U.S.S.R.*, from 3.3 to 16.2 billion pounds; *China*, from 5.9 to 16.7 billion pounds; *Norway*, from 2.4 to 7.0 billion pounds. For *Peru*, the rise actually was 23.3 billion pounds by 1971, but the 1972 landings fell suddenly to 10.6 billion pounds because of reduced catches in the anchovy fishery. In 1973, while foreign fishing fleets harvested an estimated 7.9 billion pounds within 200 miles of the U.S. coast, the domestic fleet landed 4.4 billion pounds in the same area, and over half a billion pounds, mostly tuna, off foreign shores. It was estimated that, at the same time, U.S. marine recreational fishermen landed over 1.6 billion pounds.

The Growth of Marine Recreational Fisheries

A large number of persons enjoy the seashores and estuaries—anglers, shellfish gatherers, boaters, swimmers, and others. Recreation has become one of the major uses of coastal waters, shorelines, and estuaries, and has generated considerable economic values. These uses of the marine environment are expected to continue to increase rapidly in the next ten years.

A number of important marine species are of interest to recreational fishermen. A partial list is given in Table 2. The list is based upon the 1970 Survey of Marine Recreational Fishing. Also included are some species that are not caught in large numbers but are important because of their trophy status, decreasing abundance in recent years, or future potential for recreation.

Table 2. Principal Marine Species of Interest to Recreational Fishermen

Atlantic Coast	Gulf of Mexico	Pacific Coast
Atlantic mackerel	Billfishes	Albacore
Billfishes	Black drum	Barracuda
Black seabasses	Bonefish	Billfishes
Bluefish	Catfishes	Bonito
Bonefish	Cobia	California halibut
Cods, hakes	Croakers	Chinook salmon
Dolphin	Dolphin	Coho salmon
Drum, black and red	Groupers	Pacific basses
King mackerel	King mackerel	Pacific flatfishes
Northern bluefin tuna	Perches	Rockfishes
Porgies	Porgies	Striped bass
Puffers	Red drum	Surf perches
Sharks	Sea trouts (spotted, sand)	Tunas
Snook	Snappers	Yellowtail
Spot	Snook	
Spotted sea trouts	Spanish mackerel	
Striped bass	Summer flounder	
Summer flounder	Tarpon	
Tarpon	Tunas	
Weakfish		
Winter flounder		

National surveys of marine anglers have been few and their reliability is not considered to be high. A national study of marine fishing conducted at five-year intervals (1955-1970) by the Bureau of Census for the Fish and Wildlife Service and the NMFS, showed that the numbers of marine recreational fishermen increased in that period from 4.6 million to 9.5 million. (Figure 3.) This trend indicates that the number of fishermen will increase substantially by 1985.

Marine fishing activity rose in the same period, from 58 to 114 million angler-days. The 1970 catch of 1.6 billion pounds was equal to about two-thirds of the total U.S. food fish catch in the same year, although there are no data on what part of the recreational catch actually was consumed. No shellfishing activities were included in the studies. A survey made in 1974 on a slightly different basis, (CF #6236; NMFS, NOAA) gave a preliminary estimate of 5.7 million marine recreational fishermen in the coastal states including and north of New York State, compared with the estimate of 1.67 million in the same states in 1970 derived from the earlier Bureau of the Census survey. This estimate and the results of other regional surveys of the number and activities of marine anglers indicate that participation in marine recreational fishing is much greater than previously believed.

The discrepancies between different surveys demonstrate the need for improved and expanded surveys to provide a more reliable picture of the importance of marine recreational fishing for future planning and management. In any case, it is evident that the total number of marine recreational fishermen is tremendous and growing.

Marine angling not only provides recreation and food, but contributes substantially to the economy. It has been estimated from the Bureau of the Census surveys that the direct expenditure of marine anglers for goods and services totaled $1.2 billion ($130 per angler) in 1970. To this $1.2 billion could be added $1.5 billion in primary economic benefits resulting from marine recreational activities, a total of $2.7 billion. However, little is known of the dimensions of the commercial activities that depend on marine anglers.

Few economic surveys have been made of boat and motor dealers, and boat and tackle rentals, fishing guides, fishing piers, charter and party-boat operators, and others offering direct services to anglers, or of other activities indirectly affected by marine anglers.

In addition to the millions of anglers seeking food, recreation, and trophy fishes, there is an even larger number of people who participate in general recreational activities in the marine environment. These and many others are deeply concerned about the status of all the seas' living resources. To them the conservation not only of fishes, but of birds, mammals and other species in the marine ecosystem is of great importance. Fisheries agencies should be alert to management of fishing practices that may be detrimental to other species and develop means to avoid such damage.

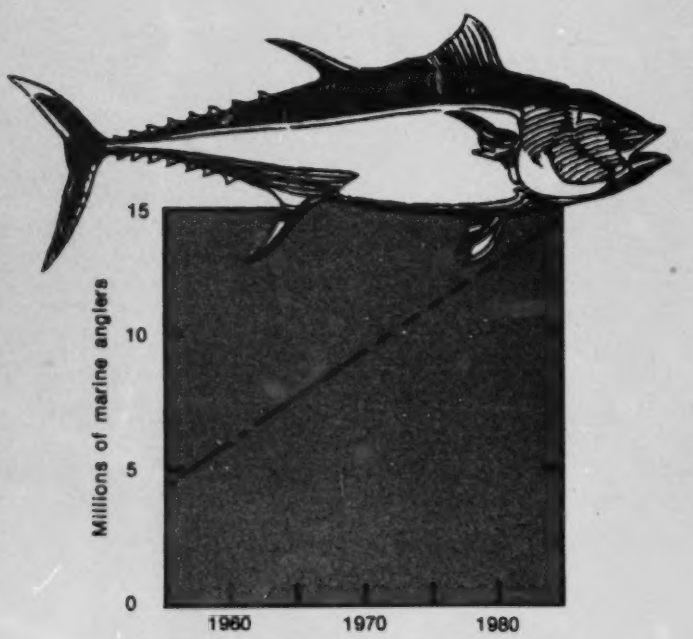


Figure 3. Trend in numbers of marine anglers. Based on Saltwater Angling Survey. (C.F.S. 6200) finfish only.

Fish and Food Supply

In 1965, FAO estimated that the maximum potential annual yield of conventional species of marine fish, crustaceans, and mollusks from the world's oceans approximated 260 billion pounds (130 million short tons). Subsequent FAO reassessments have agreed that the figure is well over 200 billion pounds. By 1972, the total catch was about 50 percent of this potential. The world nominal catch of marine fish and shellfish had increased in fact, between 1938 and 1972, from 42 to 125 billion pounds.

An ultimate total of two or three times 200 billion pounds may be possible if harvesting turns to less familiar types of marine animals. Such animals include, for example, squid and other cephalopods, heavily fished in a few areas, almost untouched elsewhere. Other examples are the krill of Antarctica and the lantern fish of the warmer oceans. Harvesting and marketing of these species on a large scale present serious technological problems. Nonetheless, some experts have estimated that the total sustainable annual harvest of all species might be on the order of at least 300 to 650 billion pounds, a volume of animal protein sufficient to furnish a substantial share of the basic requirements of a future world population of 6 billion expected by the year 2000. It is important to note that such increases in the catch of squid, krill, or other fishes low in the food chain would be likely to lead to some reduction in the catches of familiar species.

Estimates of fisheries potential must be viewed with caution. Not only are many of the data uncertain or lacking, but the estimates are based upon the harvest model of maximum sustainable yield (MSY). There has been recent criticism from the scientific community of MSY as the basis for fishery management, and scientists have suggested that the harvest should be set well below MSY to insure against ecological damage. Together with the benefits of our harvest from the sea comes the responsibility to manage that harvest to maintain present and future options and to prevent irreversible long term adverse effects.

The U.S. Supply of Fishery Products

The overall volume of U.S. commercial catches has remained essentially static over the last twenty-five years, although the proportion of foodfish landed declined from 70 percent to 50 percent. However, the U.S. consumption of edible fishery

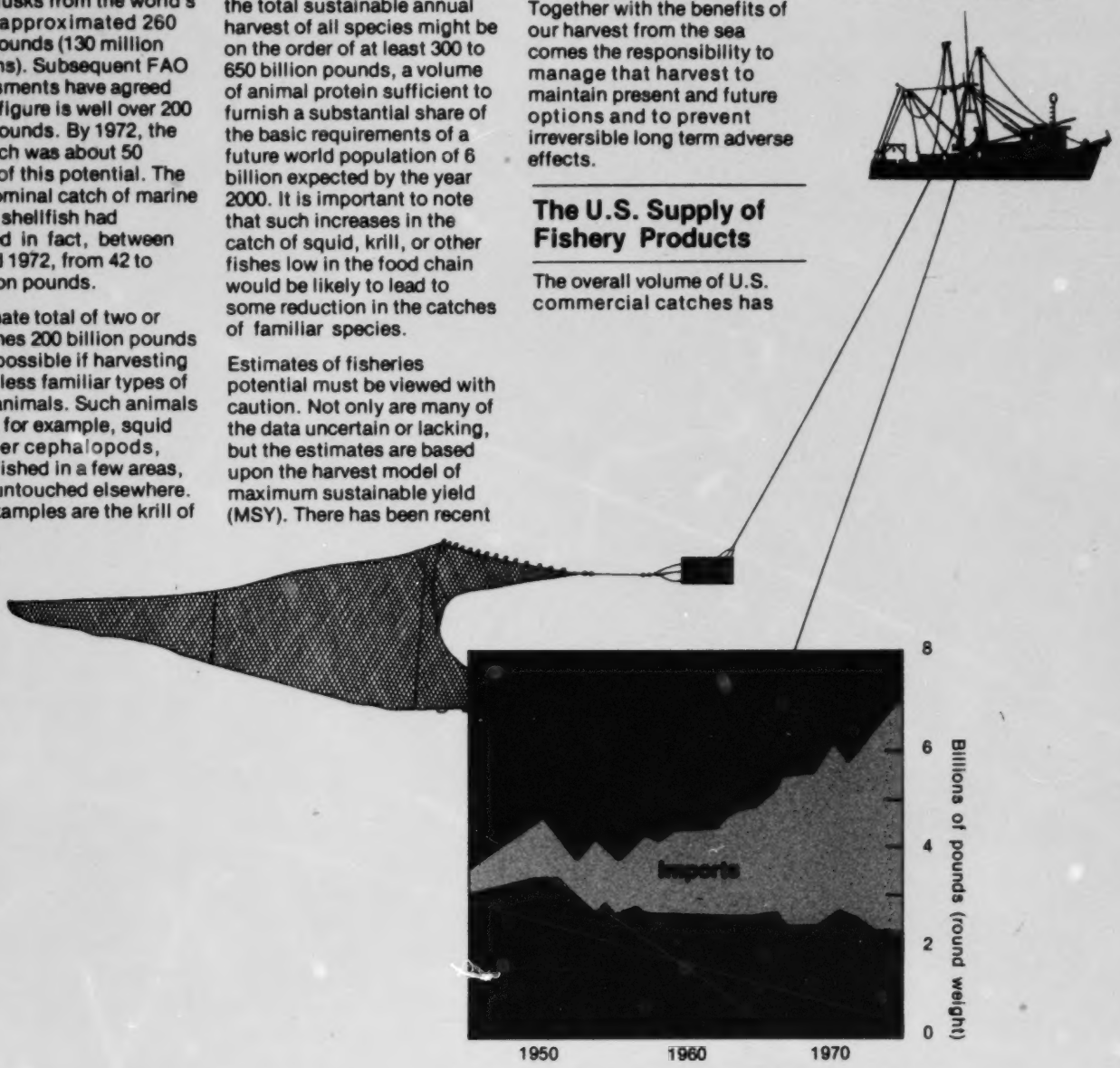


Figure 4. U.S. landings, imports, and consumption of edible fishery products.

FORECAST BASED ON PRESENT TRENDS

products did not remain constant. It nearly doubled over the same period, as shown in Figure 4. The increase was supplied by a steady growth in imports from 700 million pounds in 1948 to 4.7 billion pounds in 1973 (round weight basis)—nearly a sixfold multiplication. Imports of industrial products, principally fish meal, grew even more rapidly, reaching a high point of 13 billion pounds (round weight equivalent) in 1966. From then they declined to their lowest level since 1950—due largely to a fall in fish meal supplies from Peru. The total value of food fish imports in 1973 was $1.1 billion. The volume in round weight was twice that of the U.S. catch.

The overall record is one of increasing dependence by the United States on the products of other nations' fisheries.

So much for the past. What is the future expectation for U.S. fisheries?

Several long range forecasts of U.S. landings and imports of marine fish, by weight and value, have been made.

Two recent studies are particularly relevant.

The first study is *The Economic Value of Ocean Resources to the United States,* a report prepared by Robert R. Nathan Associates for the Commerce Committee of the U.S. Senate and submitted in December 1974. According to the Nathan forecasts, the total U.S. consumption of food fish, now 7.0 billion pounds (round weight), will grow by 1985 to between 7.3 and 8.7 billion pounds depending upon future circumstances. The landed value of this supply is put at $2.8 to $3.7 billion.

Three forecasts of U.S. food fish landings are made, each of which is based upon one of the following assumptions: (1) that conditions now existing remain constant; (2) that there is a long range improvement in management and in technological development and market acceptance of new species; and (3) that, in addition, with agreement upon or imposition of extended jurisdiction, fishing rights within the 200-mile zone are largely reserved to U.S. vessels.

Under the first assumption, Nathan foresees U.S. landings of food fish remaining constant over time at recent levels.

Under the second of these assumptions, U.S. food fish landings will increase from 2.3 to 2.6 billion pounds by 1985, an increase of 300 million pounds.

Under the third assumption, U.S. food fish landings will reach the 5.0 billion pound level, an increase of 2.7 billion pounds.

The second study is *A Baseline Economic Forecast of the U.S. Fishing Industry, 1974-1985*, developed for the NMFS by Synergy, Inc.

The Synergy study, based upon the most complete data currently available, predicts U.S. commercial landings and imports of 12 categories of fish consumption. The forecast assumes that historical trends and conditions will continue—specifically that there will be no extension of U.S. jurisdiction, that latent fisheries resources will not be developed on a broad scale, that supporting Government programs will remain at present real levels with no major alterations in program composition, and that international cooperation and sound domestic management will prevent further overfishing. Proceeding from these assumptions, and using econometric methods, the Synergy study makes its "baseline" forecasts. Among the conclusions:

- U.S. edible supplies (consumption) of seafood products will increase from 7.0 to 9.3 billion pounds (round weight) by 1985. But of this total increase of 2.3 billion pounds, 2.2 billion pounds—about 96 percent—will come from imports.
- Total U.S. landings will rise only slightly, from the 4.7 billion pounds (round weight) of 1973 to 4.9 billion pounds in 1985.
- In the commercial harvesting sector, employment, average wages, net revenues, and productivity will increase at rates experienced before 1973, although significant gains may be achieved in wages and net revenues.
- In the commercial processing sector, no more than moderate gains are expected by 1985.

The Synergy forecasts may be considered reference points from which any improvements in the future of the marine fisheries can be measured.

The Prospect in Summary

Only if present patterns are changed can U.S. fisheries meet national needs. Otherwise valuable stocks will continue to be depleted, fish habitats will continue to decrease, U.S. landings will remain static, recreational opportunities will diminish, and dependence upon imports of fishery products will grow. As NACOA noted, some actions are presently being made to counter these trends but not enough and not quickly enough.

The plan sets forth national goals to reverse these patterns and makes a series of recommendations to meet the goals. In the next section, a brief discussion of the actions needed to meet each of the goals is presented. This provides a rationale for the detailed recommendations which follow.

The foregoing survey shows the magnitude of the problems that have frustrated attempts to realize the potential benefits to the Nation of living marine resources. The prospect of extended jurisdiction offers hope of exclusive access to new resources, but extended jurisdiction will bring its own problems of management without solving, in itself, the problems of traditional concern. What can be done, then, to meet the growing demands for marine food and recreation while maintaining and strengthening the resources?

The goals of the National Plan were formulated as responses to needs in four key areas—fisheries resources, recreation, industry, and food supply. The following brief discussion describes the actions that will be required if these goals are to be accomplished.

GOAL

To restore, maintain, enhance, and utilize in a rational manner fisheries resources of importance to the United States.

Achievement of this goal is dependent on two related actions each of which will be the subject of a set of recommendations. The first is effective management of fishing operations, the second, protection of habitats essential to the life cycles of commercial and recreational fish species.

Depletion of resources through overfishing has come about because of the absence of comprehensive management. Authority for management is incomplete and varies among concerned entities. No agreed direct authority exists for management in the contiguous fisheries zone—from three to twelve miles from the U.S. coasts. While some states have well developed management capabilities, others have not. Frequently, regulations formulated for stocks of fish migrating between states differ from state to state, so that such stocks may be subject to conflicting regulations. The Federal Government has no overall fisheries management organization, although it has established a well developed capability in two of the necessary elements—research and enforcement. Management of fisheries tends to be by jurisdiction rather than, as it should be, on the basis of plans for each fishery broadly applicable throughout its geographic range. Management in anadromous fisheries is complicated by the "Boldt decision" which preempts some historical rights of states as resource managers.* This division of authority greatly increases the difficulty of effective management of these species.

Comprehensive fisheries management plans and means to implement them are needed. While present plans must be based upon the best available information on the condition of fisheries stocks and factors affecting them, the knowledge on hand is in many cases woefully inadequate. A major effort is needed to increase the information on U.S. fish stocks and greatly improve the understanding of their life cycles and ecological relationships. This information is essential for effective management and allocation decisions and for the wise use of the resources. Such data should be collected and evaluated regionally in cooperation with all interested parties. Development of plans should involve, where appropriate, exchanges of research information and statistical data with fishermen and scientists of other nations catching and studying fish stocks of importance to the United States. Plans should be directed at conserving and, where possible, enhancing fisheries resources and restoring depleted stocks. They should make provision for allocations of resources

* **U.S. v. State of Washington**, 384 F. Supp. 312 (February 1974). This recent case held that certain Indian tribes, under Treaties with the United States, had the right to take up to 50 percent of the harvestable catch in waters outside their reservations which were otherwise subject to State jurisdiction.

between U.S. and foreign commercial fishermen, and among domestic commercial, recreational, and subsistence fishermen.

Present mechanisms for enforcing compliance with fishing regulations, particularly by foreign vessels, are in many respects inadequate, and violations of regulations are frequent. An effective management system must include an enforcement capability strong enough and broad enough to make certain that violations do not occur or that, if they occur incidentally, they do not place important resources in jeopardy.

As for the actions required to protect fish habitats, other considerations are involved. Modern civilization itself places heavy pressure on marine resources. About two-thirds of the marine fishes found in U.S. coastal waters inhabit, during some parts of their life cycles, coastal and estuarine areas increasingly sought for commerce, housing, recreation, power generation, or shipping. Although it is difficult to measure the changes in productivity of fish stocks that are caused by alteration of habitats, it is obvious that continually converting fish habitats to other uses will have cumulative impact on the size and condition of the stocks. Also, in view of recent emphasis on development of the outer continental shelf, care must be taken to insure that such operations are conducted in a manner that is compatible with the continued availability of these areas as fish habitats.

Full implementation and enforcement of existing legislation, together with new legislation where needed, can provide the legal basis to limit habitat losses and degradation. Present efforts to limit losses are inhibited, however, by lack of information on the extent of the losses and their effects, and because inadequate means exist to insure that proper consideration is given to fisheries' needs in the planning and control of changes in the uses of land and water, and in other environmental modifications. More must be learned on efficient restoration of fish habitats and the information used to offset inevitable losses. More effective use must be made of present legislation to halt habitat changes in local situations when it is apparent these may have critical effects upon fish stocks.

A further important need in the area of conservation, and indeed of utilization, is to insure that educational programs are available to attract and train the increasing numbers of scientific and administrative personnel that will be needed.

GOAL

To develop and maintain healthy commercial and recreational fisheries industries.

The U.S. commercial fishing industry has before it opportunities to reach new levels of production and to expand further its already significant contributions to the Nation's food supplies and economy. For the Nation as well as for the industry, the prospects deserve urgent attention.

Projections of potential increases in U.S. landings show the effect they can have on the U.S. economy. Table 3 gives estimates of the effects on the economy of increasing U.S. landings to each of three levels. These are compared with a recent five-year average and with the increase projected by the Synergy study, which assumes a continuation of present programs and no extension of fisheries jurisdiction. It is estimated that increasing U.S. landings to meet the projected demand in 1985, i.e. by 2.3 billion pounds annually over the 1973 level, would increase the present value added to the economy by over 50 percent.

Table 3. Impact on the U.S. economy of alternative future levels of U.S. commercial landings

Levels of U.S. Landings	Assumptions	Impact on U.S. Supply 1/			Impact on economy 2/ of landings	
		U.S. Landings	Imports	Exports	Value Added $ bil.	1,000 man years
Average 1969-73	• Baseline	4.7	7.1	0.2	6.7	486
Status quo by 1985 3/	• No extension of jurisdiction	4.9	14.5	0.3	7.9	580
Extended jurisdiction (minimum case) by 1985	• Extended jurisdiction • U.S. manages resources • Industry support as now	5.5	13.9	0.3	8.7	630
Landings increased to meet NACOA recommendation 4/	• Extended jurisdiction • U.S. manages resources • Some foreign fishing • Industry support increased	7.1	12.3	0.3	10.4	760
Landings increased to displace most foreign fishing	• Extended jurisdiction • U.S. manages resources • Little foreign fishing • Increased assistance to industry to enable U.S. to replace most foreign fishing	10.8	12.3	4.0	13.8	1,000

1/ Billion pounds annually, round weight basis; Molluska—weight of meats.
2/ Estimates in 1973 dollars based on 1973 value study made by Centaur Management Associates, Inc. Total of primary, secondary and induced effects.
3/ Based on forecast by Synergy, Inc.
4/ U.S. increase in consumption of edible fishery products will be supplied from increased U.S. landings.

increasing the catch by taking over most foreign fishing, i.e. increasing it by 6 billion pounds, would make the United States a significant fisheries exporter and would more than double the value added to the economy.

What actions are needed to enable the U.S. industry to undertake such an expansion? To consider this question, one should consider what has previously limited or depressed the production of many U.S. fisheries.

In some cases, especially with fish species of high market value, expansion of the commercial fishery has been limited by supply. This may be the result of a variety of causes. Particular stocks may be fully fished and incapable of providing greater harvests. Some are depleted or restricted by quotas or limitations intended to protect recreational needs. The locations and abundance of many stocks are ill defined.

To increase production from such stocks, where this is possible, depleted stocks should be restored, especially by reducing heavy foreign fishing which may affect them. Where it is possible and useful, U.S. fishermen should be given preferential access and, if necessary, foreign fishing operations should be terminated or modified. Expansion of some fisheries may be possible in cases where larger catches will not upset ecological balances. Alternative fish stocks should be identified to provide new options for both commercial and recreational fishermen, although fishing on such stocks should proceed with caution until their capability to yield without damage is assessed. Access by U.S. fishermen to stocks outside U.S. water should be vigorously supported.

In cases in which stocks are abundant, the market may be the limiting factor. The U.S. fisherman may not be able to compete with imports which often are directly or indirectly subsidized. U.S. consumers are not familiar with some abundant species widely consumed in other countries. Some fish may not be available in attractive forms. The harvesting, marketing, and distribution systems may offer products that cost too much or are of inferior quality.

Where demand is limited, efforts must be made to increase productivity, to lower costs, and to insure higher and more consistent quality in the products. Corrective actions may lie in the directions of technological improvement in harvesting and processing, in appropriate financial assistance, in improved marketing and distribution systems, and supporting information services. The danger in this approach, however, is that as it is successful it attracts increasing capital to the fishery. This frequently raises the cost of harvesting as the fishery nears the limit of the fixed resource. Increased costs of operation can then counterbalance the gains of development programs. For this reason strong consideration also should be given to establishing limited entry programs designed to overcome the adverse effects of the common-property nature of fisheries, effects that can offset the advances in productivity secured at substantial cost through other actions. Also needed are review and revision of regulations that contribute unnecessarily to inefficiency and raise fishing, processing, and distribution costs.

The respective roles of Government and industry in achieving increased production need careful consideration. Experience in other areas such as agriculture has demonstrated that effective combinations of action can be developed to produce strong, self-sustaining industries.

In the field of recreational fishing there is need to know much more about the value and size of the U.S. recreational fishing industry, the industry which both supports and depends upon the activities of the more than nine million anglers—anglers who spent $1.2 billion for equipment, supplies, and services in 1970. Such expenditures are important to the economic well-being of uncounted numbers of small businesses, including those in the coastal "fishing centers" used by recreational fishermen. They are important to the industries which manufacture fishing tackle and gear, fishing boats and motors, and other equipment used by recreational fishermen. Assessment of these economic activities and forces is essential to understanding the condition of the fisheries industry at large, and of the kinds of attention that may be required. The businesses and industries supplying the needs of recreational fishermen are as dependent upon productive fisheries resources as are the industries involved in commercial harvesting and processing. Before the total value of the Nation's fisheries can be established, these activities must be surveyed and inventoried, their economic impacts recognized by resource management agencies, and their contributions to the Nation's economy identified.

GOAL

To improve the contribution of marine resources to recreation and other social benefits.

The remarkable growth of marine angling has been documented earlier. Projections of such growth suggest the significance of marine angling to the Nation's recreational needs, economy, and food supply, and underscore the need for careful assessment of its impact on fisheries resources. Assuming the availability of opportunities and resources, participation in marine angling is expected to increase by 1985 by as much as 50 to 100 percent over the estimates of the 1970 level. Several types of actions are needed if marine recreational fishing is to have room for this growth.

First, more information is needed on fish stocks of present and potential interest to recreational fishermen. Only with such information will it be possible to make rational decisions in the management of resources—to protect and manage preferred stocks, to offer alternatives to species heavily fished, to make equitable allocations among users, and to maintain the conservation of resources as a whole. Anglers themselves must be given better opportunity to offer advice and comment before management makes allocation decisions. Research on the effects of recreational fishing on marine fish stocks should take into consideration the possibility of the future need to develop restrictions on sizes, seasons, and gear similar to those now applied to some freshwater fisheries.

Second, it is essential to obtain more and better data on the numbers of anglers and on their activities and expenditures. Such data will help put the total activity in perspective and enable supporting industries to respond more readily to changing requirements. In addition, improved means should be developed for monitoring and evaluating the economic impact of recreational fishing.

Third, action must be taken to improve access to recreational fishing areas. As marine anglers increase in numbers, shorelines, fishing piers, and boating facilities become crowded and congested, creating conditions that diminish the enjoyment of fishing. The problem is especially acute near metropolitan centers, where recreation is most needed. Relief must be sought by expanding areas and facilities already available, and by opening public lands now closed to anglers. The development of additional access must be undertaken with full consideration of the effects on the distribution of angling effort and resultant effects on local stocks of recreational species. Attention must also be paid to the need to retain attractive fishing conditions. The desire for a certain degree of isolation may be an important part of anglers' motivation.

GOAL

To increase the supply of wholesome economically priced seafood products to the consumer.

The average person in the United States consumed directly 12.6 pounds of commercial edible fishery products in 1973. Most of the industrial fishery products used in the United States enter the human food supply indirectly as animal rations. When these are added to the edible consumption and both are expressed as round weight of fish it gives a total use of 48.7 pounds per person. To this should be added at least 7.5 pounds of fish and shellfish from recreational catches for a total use of about 56 pounds per person in 1973.

The Synergy study estimated that the U.S. consumption of edible fisheries products would increase by 1985 by 2.0 to 2.5 billion pounds (round weight equivalent). If this increase is to be met by U.S. commercial fishermen, the present U.S. catch of edible fish must be approximately doubled and the total catch, including industrial fish, increased by about 50 percent. Such requirements constitute a major challenge, and the advent of extended jurisdiction offers a new opportunity to go beyond this point and to supply export markets created by growing world demand.

Larger supplies for the U.S. market may come from several sources. The first priority would be to increase U.S. landings of natural stocks off the U.S. coasts. This could be done in three ways: (1) by restoring fish stocks presently depleted (although this could take many years and in some cases might not be possible); (2) by increasing the U.S. fishermen's catch of stocks now taken off U.S. coasts by foreign fishermen; and (3) by developing fisheries, products, and markets for resources now unutilized or underutilized.

Projected increases in consumption of some species cannot be met from U.S. stocks which now are fully exploited or offer only limited capability for expansion. In such cases solutions may lie in the development of commercial aquaculture, and provision must be made for developing a sound scientific, engineering, and economic basis to enable industry to supply future demands that cannot be met from natural stocks.

Food products must be wholesome, safe for consumption, and of a quality that encourages consumer interest and confidence. Because fresh fish spoil more rapidly than most other foods, the quality of fisheries products, and consequently their acceptance in the market place, is often highly variable and should be improved. The growing variety of species available and of processes for converting them to products for retail consumption, calls for improved labelling to better inform consumers.

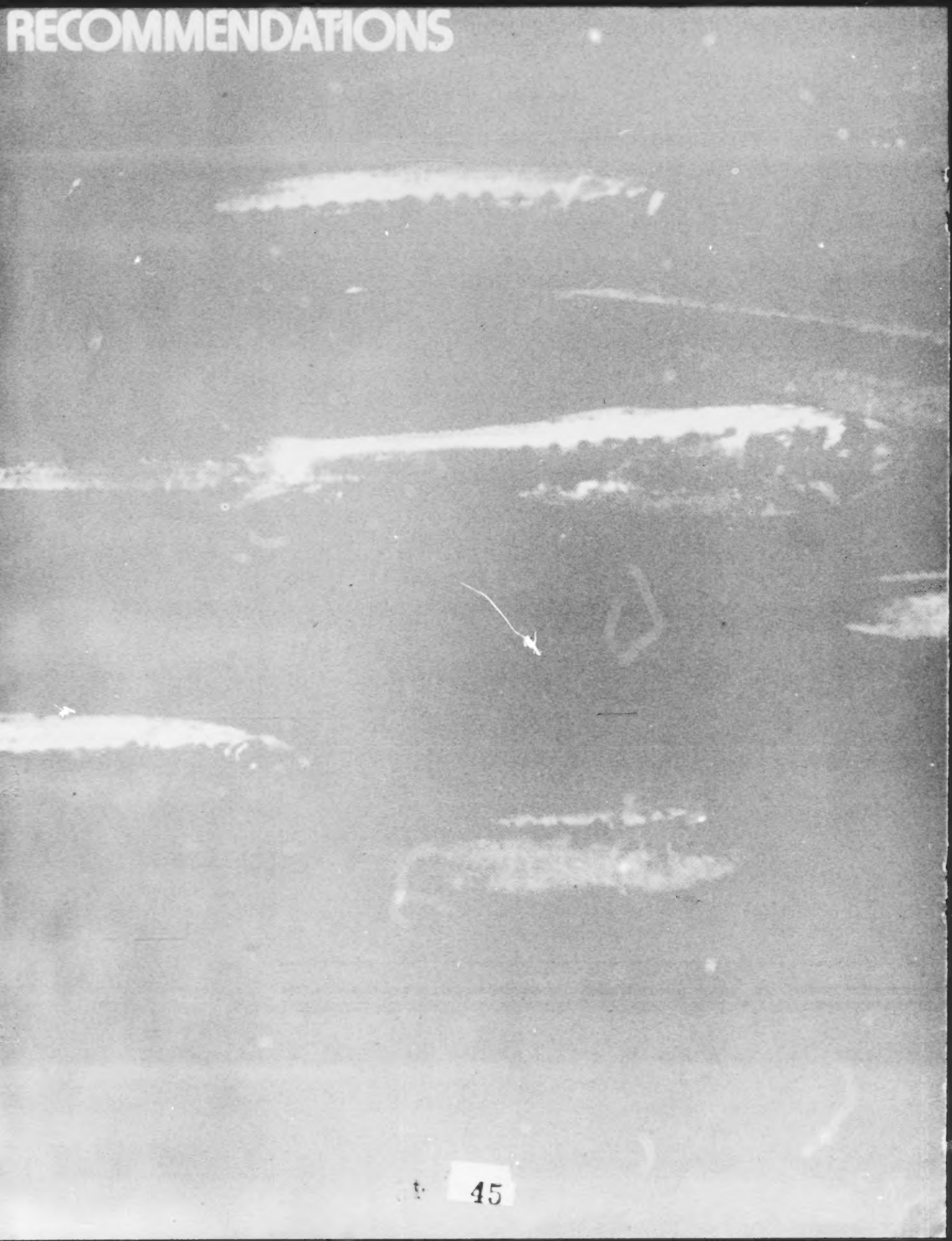
The following outline shows the relationship between the goals of the plan and the recommendations.

OUTLINE OF POSSIBLE MAJOR POLICY THRUSTS OF A NATIONAL PLAN FOR MARINE FISHERIES

	Areas of National Concern		Goals for Marine Fisheries
FISHERIES RESOURCES	• Depletion of some fish stocks due to overfishing, including heavy fishing by foreign fleets. • Shortage of information on condition of certain stocks of major interest • Inadequacy of procedures for allocating harvests	• Diffusion and lack of responsibilities for management • Broadening of responsibilities under extended jurisdiction	• Restore, maintain, enhance, and utilize in a rational manner fisheries resources of importance
	• Degradation of fisheries environment		
INDUSTRY	• Segments of industry chronically depressed • U.S. landings remain static • Some imports underselling domestic production • Overcapitalization in some fisheries • Productivity not improved, or decreased in some fisheries	• Regulations impose inefficiencies in some fisheries	• Develop and maintain healthy commercial and recreational fishing industries
RECREATION	• Lack of biological information on recreational fishes • Increasing demand for recreational opportunities • Growing need for access to recreational fishing • Potential competition with commercial fish-	eries for limited fish resources • Lack of information on numbers, fishing efforts, and expenditures of recreational fishermen. • Lack of information on size, value, and structure of industries supporting recreational fishing.	• Improve the contribution of marine resources to recreation and other social benefits
CONSUMER AND FOOD SUPPLY	• Providing for increased consumption of fishery products • Increasing dependence by U.S. on imports • Catches of some species at or near maximum limits	• Quality and occasional safety problems with some fishery products	• Increase the supply of wholesome economically priced seafood products to the consumer

Possible Major Policy Thrusts and Implementing Proposals		Anticipated Results	
• Manage for optimum utilization • New State / Federal institutional arrangements including regional organizations • Improve biological and statistical information • Wide consultation on planning • Mechanism for allocation and limited entry	• Expand surveillance, enforcement • New mechanisms for management costs • Provide opportunities for continued U.S. harvests of highly migratory species and harvests in areas of historic importance • New international arrangements	• U.S. stocks of fish restored and conserved • U.S. fishing opportunities in waters outside U.S. jurisdiction maintained	
• Consider fish habitats in decision-making affecting these areas • Mitigate losses, restore habitats lost or degraded, and enhance habitats where feasible	• Establish as necessary, sanctuaries and reserves • Improve and disseminate needed information	• Improved conservation of fish habitats	
• Legislation to reaffirm national interest in a strong U.S. fishing industry • Establish an effective fishery development program • Expand programs for fishery technology, financial assistance, and providing economic and	marketing information • Provide technical assistance, grants and loans to establish fisheries cooperatives • Consider controlled access of certain fisheries • Minimize impact of restrictive laws	• Increased U.S. production • Decreased dependence on imports • Improved international competitive position of U.S. commercial fishing industry	• Increased income and employment in commercial and recreational fishing industries.
• Expanded information on recreational fishery resources for management and participation • Increased abundance and availability of recreational fishes • Increased access to shorelines, fishing waters, and fish	• Evaluation of the needs for assistance of commercial enterprises in developing access, facilities and services upon which marine fishermen depend	• Improved information on recreational fisheries for management, planning, and supporting services • Improved access for marine fishing opportunities	• Greater and more diversified opportunities for marine angling
• Increase U.S. landings 2.3 billion pounds by 1985 • Develop public and private aquaculture for selected species • Mandatory inspection of seafood products	• Develop a uniform system for identification of seafood products	• Assured supply of fishery products to U.S. consumers • Improved U.S. balance of payments • Safe, wholesome, and clearly identified fishery products for U.S. consumer	

RECOMMENDATIONS



TO IMPROVE MANAGEMENT AND CONSERVATION OF MARINE FISHERIES

Recommendation 1.

Establish policies, plans, and institutional management arrangements to restore, maintain, and enhance fish stocks within U.S. jurisdiction, to ensure the equitable allocation of these stocks, and to assist in the conservation of stocks of importance to the United States outside U.S. waters.

1.1 Manage fish stocks for optimum utilization. [301(a)(1).]*

1.2 Establish state and Federal institutional arrangements for management of domestic fisheries resources. [302, 303, 304, 305, 306.]

1.3 Ensure that interested parties have opportunity to advise on the needs for fisheries management plans and the contents of them. [302(g)(2), 302(h)(3), 305(a), 305(b).]

1.4 Develop a sound statistical and scientific data base for the fisheries resources to be managed. [301(a)(2), 304(4).]

1.5 Improve and expand Federal and state surveillance and enforcement capabilities as needed. [311.]

1.6 Provide a mechanism which would permit for limiting entry into fisheries where biological, economic, and social evidence shows such action to be appropriate. [303(b)(6), 304(c)(3).]

1.7 Establish a mechanism for allocating the harvest, providing for regional variations as appropriate. [201(4), 301(a)(4).]

1.8 Develop a funding system to pay management costs. [204(b)(10), 304(d).]

1.9 Provide a continued opportunity for U.S. fishermen to participate in fisheries for highly migratory species wherever they are found, to have access to areas of historical U.S. fishing that may be within the jurisdictions of other nations, and to participate where appropriate in fishing for underutilized species within other nations' jurisdictions, and not subject historically to U.S. fishing. [202(a)(4).]

1.10 Strengthen international arrangements with respect to salmonid stocks of U.S. origin and other fish stocks shared with adjacent nations. [202(a)(4)(B).]

The Federal Government has no authority to manage fisheries except in cases where international treaties, endangered species and, in certain instances, creatures of the shelf are involved. It is anticipated that with extension of U.S. fisheries jurisdiction the United States will be given the responsibility for management and conservation of fish stocks out to 200 miles from shore. A new national policy should be adopted to create a cooperative State/Federal management authority to overcome deficiencies which have existed in the past. For fisheries resources which are predominantly within the jurisdiction of a single state, management responsibility should remain with that state. For fish stocks predominantly within three miles and shared by two or more states, or which migrate seasonally between state and Federal jurisdictions, management should be by the states, with Federal assistance and advice. Provision should be made for the Federal Government under certain conditions to break impasses which may arise between states in the management of such stocks. For fisheries beyond the territorial limit, management should be by the Federal Government, with advice and assistance from

* The numbers in parentheses following each management recommendation refer to the corresponding sections in the subsequently enacted P.L. 94-265.

the states. Whatever governmental jurisdiction is responsible for a particular fishery, it must have authority to manage a stock throughout its range.

The policy and implementation decisions made concerning state and Federal roles in management must take into account the needs and interests of commercial and recreational fishermen and the general public. Statistical and scientific information will have to be obtained as quickly as possible on stocks of significant value to establish sound bases for management decisions. Existing surveillance and enforcement programs will have to be improved and expanded to assure compliance with management programs. A system of fees should be established to support the management program.

Present international arrangements will have to be modified as a result of the expected extensions of the fisheries jurisdictions of the U.S. and of other coastal nations. Studies of new policies and mechanisms should be started soon to make certain that the new arrangements properly recognize U.S. interests. The arrangements must provide for (1) the protection of salmonid stocks of U.S. origin; (2) the maintenance of stocks of highly migratory species and stocks historically fished by U.S. nationals, but now within the jurisdictions of other countries; and (3) the continued access by U.S. fishermen to all such stocks.

Two fundamental changes from present practice and policy are proposed here: (1) allocating the responsibility to the Federal Government for management of fisheries that remain predominantly outside the territorial limit, and (2) providing the opportunity to control access to a given fishery when it can be demonstrated that exercise of this option is desirable or necessary.

1.1

Manage fish stocks for optimum utilization.

Optimum utilization is defined as that which provides the greatest benefit to the Nation as determined on the basis of all relevant economic, social, biological, and environmental factors, but in any event sets the level of harvest below that which will cause ecological damage. It offers the flexibility that enables management to meet the wide variety of needs occurring in different regions and different fisheries. It involves a continuing process of establishing and evaluating goals for a fishery through consideration of all aspects of local, regional, and national interest, and the use of the best available techniques to achieve these goals. Particular resources may be reserved for recreational or commercial fishing in situations in which social, economic or other factors make joint use inappropriate.

Maximum sustained yield should be a basic guideline for optimum utilization of the total biomass or of individual species, as appropriate. The harvest should not exceed MSY except in unusual instances in which it is determined to be desirable to fish a stock more heavily for a specific purpose, e.g., to reduce the abundance of dogfish to improve the fishery for associated species. Where relevant ecological information is lacking, harvest may be set at some fixed level below MSY. Where such data are available and cannot be considered in making an MSY estimate, they should be evaluated as objectively as possible and considered in establishing the harvest level. Under optimum utilization, MSY may be established as the management objective in one fishery and maximum net economic yield the objective in another. In some fisheries, either MSY or maximum net economic yield may be the principal objective. The objective may be modified by other objectives, as determined to be appropriate, provided there is a full understanding of the effects of such modification on the principal objective.

A variety of situations will be encountered in determining the optimum utilization of fish stocks. For some fish stocks it may be desirable to prohibit or reduce harvest for a period to rebuild them, or to permit only a limited harvest to maintain the stocks as prey for more desirable species. With some stocks the harvest may need to be restricted to control the incidental catch of immature fish of a more valuable species, whereas in still other stocks optimum utilization may involve permitting the harvest of immature fish. In certain stocks used by both commercial and recreational fishermen, the objective of management may be to maintain the population at a higher level than essential for ecological balance to provide better recreational fishing. Management for optimum yield must give adequate recognition to the need for safety factors which allow for the uncertainty of biological information. Management plans must be designed to retain future options for each fishery.

1.2

Establish state and Federal institutional arrangements for management of domestic fish resources.

The structures of institutional arrangements for fisheries management should take into account the types of management planning and operations involved. As visualized in this recommendation, a management plan is a comprehensive statement identifying the objectives appropriate to a fishery and setting out actions for achieving them. A management plan usually will be prepared for a single species or for a group of associated species, and if possible for a total biomass.

Any management plan should be developed with consideration of all available information on the interrelationships among the subject species, the associated species, and the environment. A basic assumption in these recommendations is that management plans will be established for individual stocks or groups of stocks wherever they occur, rather than for each jurisdiction in which the stock or groups of stocks occur. Management measures may differ in various parts of a stock's range, based on established need for such variations, but they will be related to the overall management plan for the stock.

1.2.1 Establish major policies and guidelines for managing fisheries in the contiguous fisheries zone and for implementing the management program for them.

Basic national policy for marine fisheries management should be established by Congress through a fisheries management act. Within the policy set by Congress, NOAA should develop national guidelines and criteria to guide the operations of the Regional Fisheries Management Organizations to be described later. In development of such guidelines and criteria, maximum opportunity to

contribute advice and counsel should be afforded the states, commercial and recreational fishermen, other user groups, and concerned organizations and individuals.

1.2.2 Fish stocks that occur predominantly within the jurisdiction of a state should be managed by that state.

Each coastal state should review and bring up to date, in light of increasing pressure on the resources, its programs for management of fish stocks of significant value in its territorial waters.

1.2.3 Fish stocks that occur predominantly in the territorial sea and are distributed in or move through the waters of two or more states should be managed jointly by the states with Federal assistance through Regional Fisheries Management Organizations (hereafter Regional Organizations).

These Regional Organizations should be created by Federal legislation. Each should include among its voting members the head of the fisheries agency in each state of the region and the Regional Director of the National Marine Fisheries Service. The Regional Organizations should be given the following powers and duties.

1. To recommend to the Secretary which stocks of fish are of sufficient importance to have management plans prepared for them.
2. To prepare management plans for these fisheries and to submit them to the Secretary for review, for amendment if necessary, and for approval and promulgation by the Secretary.
3. To submit recommendations to the Secretary on guidelines and criteria such as optimum yield, domestic/foreign quota allocations, and fees to be charged domestic and foreign fishermen.
4. To combine or coordinate their efforts with adjoining Regional Organizations where a particular fish stock extends beyond the geographic area of responsibility of a single Regional Organization.

In the development and implementation of management plans for a fishery not shared by all of the states in the region, the Regional Organization could operate through a sub-group consisting of members from the affected states and the Regional Director of the National Marine Fisheries Service.

Each Regional Organization should have a professional staff with necessary clerical support to coordinate the work and conduct essential necessary functions in communication and liaison.

The management plans should be developed by the affected states and the Federal Government working through the Regional Organizations. Where possible, the plans for fish stocks predominantly in the territorial sea and distributed between two or more states should be implemented by regulations enacted in each of the affected states. State fisheries agencies which do not have the authority to adopt such regulations should seek amendment of their basic statutes to give them the regulatory authority needed for effective management. Appropriate language for such an amendment is available in the suggested "Marine Fisheries Management Act" developed by the National Task Force of the Council of State Governments. Federal legislation should provide that if the states cannot agree on a management plan, or if they are unable to implement an agreed upon plan, the Secretary of Commerce should prepare a management plan for the fishery concerned and assume responsibility for regulation of the fishery pursuant to the management plan.

1.2.4 Fish stocks occurring predominantly in the contiguous fisheries zone should be managed primarily by the Federal Government with the advice of the states through the Regional Organizations.

Federal legislation should be enacted which will allow implementation of management plans and regulations for stocks that are distributed primarily beyond the territorial sea, but which allow for management of such stocks through their range. The Regional Organizations will have all of the same responsibilities and authorities for contiguous zone resources as outlined above in Section 1.2.3, for stocks distributed predominantly in the territorial sea between two or more states.

The Federal Government may delegate to a state or a group of states certain aspects of the implementation of a management plan where the state or states have demonstrated the interest and

capability to assume these responsibilities. Among these is the opportunity to participate as fully as legally possible in providing advice and guidance to the Federal Government on the negotiation of international agreements affecting fisheries of concern to a region. Joint involvement of Federal and state representatives will assure maximum contributions of state information and experience and will help eliminate the misunderstandings and conflicts that may result if the concerned states have inadequate opportunity to be heard in international negotiations.

1.3

Insure that interested parties have the opportunity to advise on the needs for fish management plans and the contents of them.

Commercial and recreational fishermen will be affected by management regulations. Representatives of conservation and consumer interest groups will be concerned with the effects of the fisheries and fisheries management programs on the environment and on the food supply. In addition, effective fisheries management requires the cooperation of various segments of the industry in implementation of management plans and in furnishing data for stock assessment and information on fishing operations. It is essential, therefore, that these interested groups be involved in the development of management plans.

1.3.1 The existing Marine Fisheries Advisory Committee could function as the national advisory body to the Administrator of NOAA on fisheries management.

1.3.2 Federal legislation should authorize the Regional Organizations to appoint advisory committees as needed.

1.3.3 The Federal Government and the Regional Organizations should solicit through public hearings and other mechanisms the advice and cooperation of interested parties regarding plans and proposed regulations.

1.4

Develop a sound statistical and scientific data base for the fisheries resources to be managed.

Effective management requires information on the abundance, distribution, and condition of stocks and the effects of various fishing levels and of environmental changes on stock abundance and distribution. Such information is being obtained on a number of stocks at present under the National Marine Fisheries Service's Marine Resources Monitoring, Assessment and Prediction (MARMAP) program and through research programs of some states. However, it is presently far short of that needed for effective management of many fisheries.

In addition to the MARMAP program, much applied and basic research on marine fish resources and fisheries is being conducted by the Federal Government, the state governments, and universities. The effectiveness of this research should be evaluated in light of demands of management and new efforts channeled into voids found. In addition to biological information, effective management requires studies on the economic and sociological aspects of fisheries concerned, and additional research to improve fisheries management methods.

1.4.1 Establish standards for assessment of fish stocks as part of the national policies and guidelines for fisheries management.

1.4.2 Expand the National Marine Fisheries Service's Marine Resources Monitoring, Assessment and Prediction program, including cooperative fish stocks assessment work with the states, universities, and the industry, to obtain on a continuing basis the needed information on all fish stocks to be managed.

1.5

Improve and expand Federal and state surveillance and enforcement capabilities as needed.

Effective surveillance of fishing operations and enforcement of regulations are required to insure the success of fisheries management programs. The pattern of enforcement and surveillance activities now carried out covers fishing areas adjacent to the United States with a frequency that provides generally good coverage. However, to provide the surveillance and enforcement efforts required for sound management throughout the area of extended jurisdiction will necessitate an increase in the size and cost of these programs. The cost of enforcement can be lessened and the fishermen's problems and costs in complying with regulations reduced if enforcement aspects are given proper attention in developing regulations.

States should continue to have primary responsibility for surveillance and enforcement within state territorial waters.

1.5.1 As the Federal agency responsible for the management of marine fisheries resources, NOAA should develop and implement, in cooperation with the U.S. Coast Guard and with the states as appropriate, effective national surveillance and enforcement programs in the areas of U.S. jurisdiction.

To strengthen enforcement capabilities, and to achieve the most cost-effective surveillance of foreign as well as domestic fishing activities, the program should employ all appropriate procedures, including: (1) mandatory reporting through established communication systems and methods; (2) mandatory reporting in log books; (3) positioning equipment and remote sensing; (4) surveillance flights; (5) observers on selected vessels; and (6) random vessel patrols to perform at-sea boardings and inspections. Dockside inspections of the domestic fleet also should be performed. The possible contributions of information by military, space, and intelligence agencies should be considered in development of the surveillance program.

1.5.2 Integrate to the fullest extent practical the capabilities of the states and of the Federal Government for surveillance and enforcement. States demonstrating interest and capability in surveillance and enforcement of fisheries regulations over U.S. citizens beyond state territorial waters should be encouraged, and may be financially assisted, to participate in joint surveillance and enforcement of fisheries regulations under Federal deputization.

1.5.3 Expand research and development with respect to new and innovative surveillance and enforcement systems and techniques, including electronic and satellite monitoring.

The goals of such improvements should be to reduce the costs and increase the effectiveness.

1.5.4 Give to NOAA the authority to impose civil penalties for violations of Federal fishing regulations by domestic fishermen.

The prosecution of violations should be quick and equitable. Prosecution under civil proceedings to the fullest extent possible will assure uniformity of application throughout the country and quicken settlements.

The attorneys and the Federal courts should remain responsible for prosecution of foreign violators of U.S. regulations. The U.S. Department of State should continue its role with regard to enforcement upon foreign fisheries as this relates to U.S. foreign policy.

1.6

Establish a mechanism for limiting entry into fisheries where biological, economic and social evidence show such action to be appropriate.

It should be pointed out at the onset that this proposed concept does not visualize the imposition of a limited entry system on any given fishery at this time. Intensive evaluation, industry review, and other studies would of necessity precede any action. Limited entry is not an essential component in management of most of our fisheries. It is an option which would benefit our fishermen in some cases and should be maintained as an option.

Fisheries in the United States have been treated as a common property resource, and have not generally been associated with clearly defined and enforceable property rights except for leasing of lands for shellfish culture, and salmon in private hatcheries. Access to a resource is open, and it may be exploited by all who wish to engage in fishing. In general, as a fishery develops and profits increase, more effort is attracted to the industry. Up to a certain point, larger yields can be harvested with greater amounts of fishing effort, but continuous increases in effort beyond that required to harvest the maximum sustainable yield result in diminishing catches.

Even if overfishing does not take place, there are sometimes undesirable economic consequences to free access. More vessels tend to be attracted to the industry than are necessary to harvest the available resource. Excessive capital and labor frequently enter the fishery under these circumstances. As excess fishing effort is applied, the cost per unit of production increases. The total revenues are shared by more and more producers until no profit remains to be distributed, and revenues equal costs.

Before fisheries reach this point, economic efficiency should be improved through the use of less fishing effort. In economic terms, the most efficient operation of the fishery occurs when the maximum net economic revenue is produced. The economic benefits which result can be shared by the fishermen and the consumer.

The inability of present U.S. management machinery to limit entry into coastal fisheries has in some situations resulted in overexploitation, overcapitalization, and user conflicts.

Several techniques can be employed to limit entry to fisheries, including license limitations, taxes and fees, and fishermen quotas. None of these options is universally applicable. Careful consideration should be given to which one or which combination would be best suited to a particular fishery.

In implementing limited entry, a means should be provided, usually referred to as grandfathering, of assuring special consideration of fishermen currently participating in the fishery. The transition from unrestricted access to limited entry should be accomplished as fairly as possible and the burden of conserving the resource and the vitality of the industry should be borne in a way that minimizes social and economic dislocation. Recommendations 3.2.1 and 3.2.4 propose factors to be considered in establishing limited entry.

1.7

Establish a mechanism for allocating the harvest, providing for regional variations as appropriate.

1.7.1 Give domestic fishermen preferential access to fish stocks within the 200-mile zone consistent with optimum utilization.

1.7.2 Give foreign fishermen access to fish stocks beyond 12 and up to 200 miles up to the optimum utilization level after the needs of domestic fishermen have been accommodated.

In establishing optimum utilization of a fish stock, a part of all of the potential yield may be reserved to prevent the incidental catch of immature fish of other stocks, to provide recreational fishing of better quality, to provide prey for other species, or for other management purposes.

1.7.3 Allocate U.S. fisheries resources in excess of U.S. requirements among foreign countries according to provisions expected to be included in a treaty emerging from the Law of the Sea Conference. In the absence of a treaty, consider among other things the demonstrated willingness of affected nations to abide by sound conservation measures, the existence of traditional foreign fisheries and the special needs of interested nations. As a condition of licensing, foreign fishing vessels should be required to record and submit appropriate catch and effort data.

1.7.4 Any harvest allocation among states of interstate fish stocks and stocks in the contiguous zone should be made by the Regional Organization as part of the management plan for that stock.

1.7.5 Any harvest allocation of stocks which occur totally within the waters of a single state should be made by that state.

1.8

Develop a funding system to pay management costs.

Management costs include the costs of operations, research, regulation, relevant environment protection, and enforcement. A management system which will restore depleted stocks, and maintain stocks at high yield levels will cost substantially more than the present management efforts, even with improved efficiency of operations. The present annual expenditures for surveys and other activities related to management of marine fisheries are estimated to be about $110 million—$60 million by the coastal states, $25 million by NOAA, and $25 million by the Coast Guard.

Adequate funding is essential to the success of management and thus to the ability of the United States to carry out its responsibilities for conserving and utilizing the fisheries resources in the area of extended jurisdiction. At present, management programs are funded primarily from Federal and state general funds and state license fees.

If dependence were placed solely on the continuance of the present system of funding, major increases in general funding would be required on the part of both State and Federal Governments. Since such appropriations would have to compete with other high priority state and national needs, it appears unrealistic to expect general fund appropriations to provide all of the additional funding required for long term fisheries management. It is probably equally unrealistic to expect all management cost to be borne by fishermen. The result is likely to be that some increase in appropriated funds will be required, especially during the period of transition to a comprehensive management regime, but that some part of the ultimate cost can be covered from license fees and other charges.

1.8.1 Continue the present system of funding fisheries management from various Federal and state sources and expand as appropriate.

1.8.2 License all domestic marine commercial and recreational fishermen and allocate the income to the state and Federal management agencies.

Some states now have licensing systems for marine commercial and/or recreational fisheries, and in some cases significant income is derived from these. On the other hand, the management system envisioned will place new responsibility on the Federal Government, involving additional costs, including aid to the states to expand their own management capabilities. In developing the policies for cooperative State/Federal fisheries management it has been assumed that some of these costs can be covered from income from license fees on the fisheries. A vexing problem exists on how an equitable arrangement of a Federal and state license fee system can be erected which will not deprive the states of existing income, which will provide the Federal Government with a share of future income, and which will not impose an improper burden on the users of fishery resources. This problem requires immediate study.

The state and Federal licensing systems should be coordinated so as to support the management programs by providing the means to obtain needed catch and effort statistics. Licensing, irrespective of the existence or amount of a fee, is essential to the collection of much of the basic statistical information required by a resource management program.

For a more detailed recommendation on licensing of marine recreational fishing, see Recommendation 4.1.3.

1.8.3 The states should give consideration to appropriate poundage fees for domestic commercial landings as a source of funding for management programs.

1.8.4 The Federal Government should assess fees on all foreign fishing permitted within the U.S. jurisdiction.

In addition to the authority to assess a fee to pay management costs, the Federal Government should be able to reserve the right to place a charge on foreign fishing, for use of the resource, when such a charge is determined to be appropriate.

In establishing a fee system for foreign fishing, consideration should be given to its relation to the fees that are being charged or may be charged U.S. nationals by foreign countries for fishing in their waters. The possibility of levying appropriate additional taxes on imports of fisheries products as a means of defraying management costs also should be explored.

1.9

Provide continued opportunity for U.S. fishermen to participate in fishing for highly migratory species wherever they are found, to have access to areas of historical U.S. fishing that may be within the jurisdictions of other nations, and to participate when appropriate in fishing for underutilized species within other nations' jurisdictions not subject historically to U.S. fishing.

The United States has large and valuable fisheries for highly migratory species, primarily tuna, conducted in large part in international

waters or in waters that may come within the jurisdictions, as extended, of other coastal nations. Present arrangements are inadequate for international management of these species. As with coastal stocks, highly migratory stocks should be managed as entities throughout their ranges and despite their distribution or migrations from one national jurisdiction to another.

Other major U.S. distant-water fisheries including those for shrimp off Mexico, Brazil, and the Guianas will be affected by the extension of the exclusive jurisdictions of these countries. The designation of the spiny lobster species as a creature of the continental shelf by the Bahamian Government has adversely affected U.S. fishermen.

1.9.1 The U.S. Government should advocate and participate in international fisheries management programs designed to conserve highly migratory fish stocks throughout their ranges and to provide opportunity for U.S. fishermen to participate in these fisheries.

1.9.2 Highly migratory species such as tunas, billfishes, and sharks, which are found in international waters, should be managed by appropriate international organizations. Each coastal nation should control its nationals fishing these stocks in accordance with the promulgated regulations. When the fish migrate into the contiguous zone of a coastal nation, that nation should regulate all fishing for these stocks, again in accordance with regulations established for conservation and management of stocks by appropriate international fisheries organizations. In the absence of international agreements, management should be undertaken by State and Federal Governments as appropriate.

1.9.3 The U.S. Government should negotiate international agreements to secure continued opportunity for U.S. fishermen to participate in historical U.S. fisheries within the extended jurisdictions of other nations, and to permit U.S. fishermen to participate when appropriate, in fishing for underutilized species within the jurisdictions of other nations and not subject historically to U.S. fishing.

Results such as these might be accomplished by:

1. Negotiations of reasonable license fees for U.S. fishermen when such are appropriate.
2. Negotiations of reciprocal fishing rights with adjacent countries.
3. Offering U.S. research and technical assistance in various fields, including fisheries, to help the cooperating nations.
4. Providing opportunity and technical assistance for establishing joint fishing ventures in foreign countries.
5. Negotiations of preferential tariffs for entry of fishery products from nations permitting entry of U.S. fishermen.
6. Training for fishermen in developing countries to utilize their local coastal fisheries.

1.10

Strengthen international arrangements with respect to salmonid stocks of U.S. origin and other fish stocks shared with adjacent nations.

The U.S. Government should seek agreement in the Law of the Sea Conference and in international commissions to minimize the catch of U.S. salmonid stocks on the high seas beyond the U.S. contiguous zone. The United States should develop agreements with the coastal nations to minimize the catch of U.S. salmonids in their respective contiguous zones and should seek bilateral or multilateral ccoperation where U.S. salmonids intermingle with the salmonid stocks of other coastal nations.

The United States and other nations may have joint interest in other fish stocks off their respective coasts because certain stocks such as halibut, cod, flounder, northern anchovy, and shrimp migrate or are distributed between their areas of jurisdiction.

1.10.1 Obtain prohibition of high seas salmonid fishing by all parties beyond the country-of-origin's continguous zone as part of a Convention resulting from the LOS Conference.

1.10.2 Seek acceptance of the concept of country-of-origin management of salmonid stocks throughout their migratory range.

1.10.3 Should the Law of the Sea Conference fail to adopt provisions protecting salmonids on the high seas, negotiate bilateral or multilateral agreements with nations having high seas fisheries with the potential to catch salmonids.

1.10.4 Manage other stocks common to the United States and adjacent countries jointly through bilateral arrangements.

New and expanded education and training programs will be needed to provide the basic information for management and to assure the implementation of management programs. There is an urgent need to develop and support such programs, not only to heighten the general awareness of the significance of the Nation's fisheries resources, but to enlarge the pools of trained personnel that will be required. The new responsibilities that come with extended jurisdiction will demand larger numbers of scientists, technicians, and administrators prepared to conduct the complex management system then necessary. The design of new programs, if they are needed, will be the function of academic institutions and technical schools, and one to which the Sea Grant Program can make an important and constructive contribution.

Recommendation 2.

Reverse the downward trends in quantity and quality of fish habitats by minimizing further losses and degradation of these habitats, restoring and enhancing them where possible, and establishing protected areas where necessary, while recognizing other compatible essential uses of fish habitat areas.

2.1 Improve the consideration given to fish habitats in key decision-making processes.

2.2 Mitigate losses of habitat, where possible restore habitats lost or degraded, and develop economically feasible enhancement opportunities.

2.3 Establish sanctuaries, reserves or other systems when necessary to protect critical fish habitats, production, and associated recreational and esthetic values.

2.4 Improve the quality and increase the dissemination of information required for effective fish habitat conservation.

A fish habitat is the geographical area and its associated environmental features required by a fish species to complete its natural life cycle. Therefore, wise use of areas that serve as habitats for finfish and shellfish is of utmost importance to all fishery interests and to the Nation.

Habitats for the Nation's marine fishery resources include the coastal areas and anadromous fish streams, (where approximately two-thirds of the country's economically important finfish and shellfish are produced) and the offshore areas, particularly of the outer continental shelf. The habitats of greatest concern are those of the coastal zone, where land and sea meet and (even more importantly), where man and sea meet. Coastal habitats support populations of animals used for food, recreation, and many other diverse and intense uses. Rising interest in developing resources of the outer continental shelf has also brought into focus the importance of fish habitats in this area.

Human activities in aquatic areas can have adverse impacts on fishery resources. The rapid increase in coastal development in the last 25 years has sharply increased the problems associated with such development. Given sufficient knowledge and management processes to use it effectively, the adverse results of many of these actions on fish can be avoided or minimized. Much has already been accomplished by legislation and research, but acceleration of these efforts is needed to reduce habitat losses while at the same time giving greater flexibility and reducing delays in essential developments in aquatic areas. Among the effects of development are the following: Disposal of untreated municipal and industrial wastes into waterways results in contamination and depletion of shellfish and finfish stocks. Fish habitats are destroyed by dredging and filling operations associated with maintenance or expansion of the Nation's navigable waters, by development of real estate properties in wetland areas, and by the removal of sand and gravel. Dams and reservoirs inundate spawning

areas, and impede spawning runs and the downstream migration of young anadromous species. Impoundments and withdrawals deplete the flow of fresh water to estuaries, and this may result in the degradation of estuarine water quality.

Some of the adverse effects on fish habitats result from essential human activities. The rapid pace of coastal development will probably continue. Therefore, the perpetuation of these habitats through the conservation of spawning, nursery, and feeding areas must be considered a national goal. Careful planning, design, and selective development can minimize adverse effects. Multiple use management can balance socio-economic needs, including those for food and recreation. As examples, prudent site selection and design of power plants can greatly reduce their impact on living marine resources; proper treatment of municipal and industrial wastes can improve degraded habitat; restricting the use of wetlands to activities which are water-dependent can minimize use conflicts; carefully planned disposal can reduce the effects of dredge and fill activities; ladders and hatcheries can minimize the impact of dams on anadromous fish; planned fresh water releases can enhance downstream habitats. Legislation already exists to accomplish many of these management actions. It must be used more effectively.

Although adverse effects on fish habitat areas can be reduced by improved management, some loss or degradation can be expected to continue. To counteract these losses, habitats should be restored and enhanced wherever possible. One of the goals of the Federal Water Pollution Control Act Amendments of 1972 is restoration of water quality "...which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water..." The removal of unnecessary dams can restore spawning areas to anadromous fish and fresh water flows to estuaries. Technology is in the offing for enhancing areas of low productivity, including the increase in net production of fish through the creation of marshlands on open water dredge disposal sites, and by the construction of artificial reefs.

Many salmonid hatcheries have been constructed to mitigate the effects of dam construction. Additional hatchery production could enhance fish production in rivers and in marine areas. Guaranteed minimum year-round releases of water from dams could promote anadromous fish production in rivers susceptible to seasonal low flows. Existing mitigation programs may be insufficient to offset the losses which are likely to occur even with improved environmental management. Increased effort is necessary to reverse the trend, and achieve higher levels of production.

In some areas it may appear that even if all feasible mitigation, enhancement, and restoration efforts were to be taken, environmental changes would result in destruction of habitats and in reductions in recreational fishing appeal. In this event, the only solution may be to set aside those areas and forbid destructive uses. The alternative would be to accept fishery and recreational losses. When a decision is made to protect habitat areas, legislation exists to establish sanctuaries in which certain activities are permitted under careful management control and regulation.

This recommendation has been developed to increase the effective use of present legislation designed to reduce degradation and destruction of marine and anadromous habitats and to minimize the burden on essential development. The following actions are required to carry out this recommendation.

2.1

Improve the consideration given to fish habitats in key decisionmaking processes.

A number of Federal and state laws have over the years been instrumental in achieving habitat protection. Of these, the Fish and Wildlife Coordination Act of 1958, as amended, the National Environmental Policy Act of 1969, the Coastal Zone Management Act of 1972, and their counterpart state laws provide the opportunities to insure consideration of fish habitat protection in marine development decisions.

Full realization of this potential will require more effective application of these laws in Federal and state planning processes. For example, the Fish and Wildlife Coordination Act requires that fishery values be considered in the thousands of federally constructed and approved marine and estuarine development actions. But current Federal and state programs under this Act do not provide sufficient information and adequately developed recommendations needed in the majority of actions. The National Environmental Policy Act has been effective in improving the consideration of fishery resources in environmental impact statements and subsequent decisions on Federal actions. However, the Council on Environmental Quality in its 1973 Annual Report expressed concern about inadequate discussions of impacts, inadequate treatment of reviewing agencies' comments, and inadequate consideration of alternatives and their impacts in a large number of environmental impact statements. Finally, carefully developed State Coastal Zone Management programs, prepared under the Coastal Zone Management Act of 1972, have the potential to conserve effectively vast amounts of fish habitat. Active participation by Federal and state fishery agencies is needed to assist in development of these plans.

The National Coordinating Committee on Fish and Wildlife and the National Water Resources Coordination Program[1/] and others have stated that improved application of these laws will require programs with emphasis in three areas: (1) increased influence in the conceptual and planning phase of development projects; (2) improved review of specific permit or license requests; (3) intensified coordination of programs among state and Federal fishery agencies. To accomplish these the following actions should be considered:

2.1.1 Amend the Fish and Wildlife Coordination Act of 1958, as amended, to insure fuller coverage of actions affecting fisheries.

Amendments should include: (1) expand coverage to projects and development of all Federal and development agencies, including outer continental shelf development; (2) include NOAA among agencies which are to be consulted on fisheries impacts; (3) strengthen mechanisms for effective consideration of fisheries, and (4) provide for transfer of funds from Federal construction and licensing agencies to fish and wildlife agencies for conducting studies and investigations required by the Fish and Wildlife Coordination Act.

2.1.2 State and Federal agencies concerned with developing or regulating land and water use projects should develop policies and practices which insure full consideration at all stages of the impact of these projects upon fisheries.

Fishery agencies should be consulted in the course of formulating policies and practices for development and regulatory agencies to insure that the impact of each program or project affecting fisheries is analyzed from the outset, and at each appropriate stage. Full impact analysis of the effects of projects and project alternatives on fisheries should be made in all Environmental Impact Statements prepared

[1/] This committee, composed of State fish and wildlife agencies, private conservation groups, the Fish and Wildlife Service and the National Marine Fisheries Service was formed in 1970 to develop and implement the recommendations of the "Action Report—Conservation and Enhancement of Fish and Wildlife in the National Water Resources Program."

under the National Environmental Policy and analogous state laws. In view of the importance of the coastal zone to the maintenance of fish stocks, it is especially important that plans developed under the Coastal Zone Management Act be fully reviewed by appropriate state and Federal agencies for fisheries impacts.

2.1.3 State and Federal agencies should develop measures to insure a closer coordination in the review and monitoring of projects and programs.

Although legal mechanisms exist which provide a basis for reviewing and monitoring projects, the number of agencies involved and their overlapping responsibilities complicates and prolongs the process, leading to delays. Effective interagency coordination could significantly accelerate action. Agencies should enter into Memoranda of Understanding or other agreements which will improve and expedite consideration given to projects and to the fisheries habitats. These should define areas of responsibility, eliminate overlapping, and insure maximum coordination in appropriate areas.

2.1.4 State and Federal agencies concerned with reviewing projects for their impact on fisheries should develop sufficient program capabilities to insure adequate review.

Full consideration of fisheries values at each stage of project planning and implementation can only be achieved if the concerned agencies have sufficient trained staff and funding to:

(1) Meet their legal obligations under the National Environmental Policy Act, the Coastal Zone Management Act, the Federal Water Pollution Control Act Amendments of 1973, and the Fish and Wildlife Coordination Act as presently written, or as amended. (See Recommendation 2.1.1.)

(2) Assist non-fisheries agencies in planning the fisheries aspects of projects.

The provision of adequate staff to meet these obligations will also speed up consideration of projects and reduce the waste of time and funds which result from delays.

2.2

Mitigate losses of habitat, where possible, restore habitats lost or degraded, and develop economically feasible enhancement opportunities.

Some development agencies are required to take actions which compensate for adverse impacts on fish stocks and habitats resulting from their programs or policies. The present requirements for mitigation are not applicable to all activities that cause habitat losses and are inadequate to assure compensation for all losses. Additional programs and policies to restore and enhance fish habitats require the following actions:

2.2.1 Federal and state agencies responsible for development and regulatory activities in marine, estuarine and anadromous fish habitat areas should develop and implement policies under which enhancement and restoration programs are instituted wherever administrative decisions result in habitat loss or degradation.

2.2.2 State and Federal fishery agencies should expand their capability to provide development and regulatory agencies with technical information and assistance for enhancement and restoration programs.

2.3

Establish sanctuaries, reserves or other systems when necessary to protect critical fish habitats, production, and associated recreational and esthetic values.

The surest way to perpetuate fish habitat areas in an unspoiled condition is to obtain title to them and establish them as sanctuaries, or under other designations that preclude degradation and alteration. A number of Federal statutes exist which permit the preservation or protection of land and water areas in such a manner. These include: the Marine Protection, Research, and Sanctuaries Act of 1972, the Coastal Zone Management Act of 1972, and National Wildlife Refuge System Administration Act of 1966. The Endangered Species Act of 1973 (Section 7) provides for the identification of critical habitat of threatened or endangered species and the need to consider its preservation in sanctuary proposals. The intent of Title III of the Marine Protection, Research and Sanctuaries Act of 1972 is to preserve or restore coastal marine areas for conservation, recreation, ecological and esthetic values. Title III provides an opportunity for state and Federal agencies, and non-government interests, such as the commercial and recreational fishing industries, private conservation clubs and societies, etc., to identify important proposals, develop information relevant to their support, coordinate with other agencies and interests, and represent fisheries values and interests, as the proposals proceed through the various stages of nomination, official designation, and development of rules and regulations regarding each proposed area. Support for such proposals by fishery agencies would facilitate the establishment of such areas, while passive or inactive support would result in fewer and smaller protected areas and less protective rules and regulations for managing them. In order to increase the Nation's reserve of protected marine habitat areas, the following actions should be considered:

2.3.1 Federal and state fishery agencies adopt and implement policies in support of appropriate proposals for the establishment of parks, refuges, and particularly marine sanctuaries under Title III, which would permanently protect and preserve fish habitat.

2.3.2 In its role of administering proposals for marine sanctuaries under Title III, NOAA's Office of Coastal Zone Management should call upon state and Federal fishery agencies for information and guidance regarding fishery resources throughout the process, from sanctuary nomination to development of rules and regulations.

2.3.3 Federal and state fishery agencies should inventory and describe all significant fish habitat areas, including critical areas of threatened and endangered species, within their respective jurisdictions in order to provide basic information and, where appropriate, to make proposals for protected areas.

2.4

Improve the quality, and increase the dissemination of information required for effective fish habitat conservation.

In order to give proper consideration to the impact of development actions upon fisheries and their habitats, decisionmakers need reliable assessments of their probable biological, economic and social consequences. Frequently these kinds of information are deficient, leading to inadequate consideration for fisheries and delay and waste in considering proposed developments. To overcome this, sufficient research must be undertaken to give information needed for equitable and wise decisions. The scope of the problem faced in maintaining and restoring fisheries habitats is immense, and the research resources are relatively small. It is therefore essential to insure that research undertaken is directly responsive to the most important long and short term problems. The Regional Fisheries Management Organizations described in Recommendation 1 could provide centers for regional guidance to evaluate ongoing and future programs of agencies and institutions conducting habitat and environmental research and suggest how their relevance may be increased.

In addition to research information, agencies responsible for environmental decisions concerning coastal development and pollution are in need of detailed quantitative information on the extent of existing habitat and the rates at which degradation is occurring. This is needed for reasoned administrative judgments concerning: trends in habitat losses due to degradation; program staffing and funding needs; and assessing social and economic fishery losses.

Followup and monitoring programs are needed to determine how previous decisions worked, and what was the short and long range effectiveness of alternative techniques for reducing environmental losses. Such evaluations would increase the effectiveness of fisheries agencies recommendations in future decisions on similar and related projects.

The success of habitat conservation programs will depend a great deal on the attitudes and actions of an informed public. Efforts are needed to provide the public with continuing, readily available factual information on important aspects of fish habitat conservation.

To reduce the deficiencies in information, its collection, and its dissemination, the following actions should be considered:

2.4.1 Increase the relevance and level of research programs on problems facing habitats to the level needed for effective environmental decisions.

The direction and relevance of research programs to provide for the effective conservation of fish habitats including enhancement programs should be insured through: (1) establishing multi-agency regional coordinating committees to identify high priority research needs; (2) conducting periodic inventories of habitat areas to determine losses at local, state, regional and national levels, using guidelines established cooperatively by state and Federal agencies; and (3) monitoring and assessing the short and long range effects of previous decisions on fisheries habitats. To meet these needs state and Federal fisheries agencies should improve and expand their in-house research programs, and encourage increased work on priority problems by regulatory agencies and universities.

2.4.2 Dedicate a portion of revenues obtained from Outer Continental Shelf (OCS) leases to suppport research of the effects of OCS development on marine fishes and their habitats.

Little information now exists to predict the effects on fishes of ecological changes which could result from development of the OCS. With increasing development it is essential to obtain information which can be used to permit OCS activities to be designed so as to produce a minimum effect on fisheries resources, their habitats, and their harvesting.

2.4.3 State and Federal fishery agencies should increase their habitat information and make it more readily available to other relevant agencies, to the scientific community, and to the general public.

Many state and Federal agencies, universities, associations, and others collect habitat information through research, surveys, regulatory procedures, hearings, etc., to serve particular needs. Much of this information would be of value in related studies and in decisionmaking. The exchange of such information between concerned groups is essential to maximum progress in conserving fisheries habitats. In addition, it is important that such information should be readily available in easily understandable forms to the general public.

TO STRENGTHEN THE U.S. COMMERCIAL FISHING INDUSTRY

Recommendation 3.

Strengthen the U.S. commercial industry to enable it to provide increased supplies at competitive prices.

3.1 Establish an effective fishery development program to enable the U.S. commercial fishing industry to enlarge its share of markets through increased productivity, lower costs, and increased acceptability of fishery products to the consumer.

3.2 Design fish management plans and revise unnecessarily restrictive regulations to permit increased industry efficiency and lower production costs.

It was noted in the introduction that U.S. commercial fish landings have remained essentially static over the last 25 years. Although the catch of several species has risen, the increases have been offset by declines in other species. At the same time world catches have tripled and foreign catches within 200 miles of U.S. coasts now exceed the U.S. catch. Moreover, the U.S. consumption of both edible and total fishery products has nearly doubled over the same time. The paradox is that there are ample resources off our shores. With the likely advent of extended fisheries jurisdiction, the United States will gain control of these stocks and be able to obtain preferential access to them. How can the U.S. commercial industry take advantage of this situation working within the need for sound conservation and the growing demands of recreational fishing?

Some U.S. commercial fisheries, such as tuna and shrimp, have shown steady growth over the years. But many of the fisheries which will come under U.S. management will consist of species for which the U.S. industry has not competed successfully in the market against foreign, often subsidized, fishermen. Also included will be species for which the U.S. consumer has shown limited interest. One key then is to provide the opportunity for the industry to operate more competitively through increasing productivity. The second key is through consumer education, product development, and marketing to increase consumer awareness and acceptance of species presently subjected to limited commercial fishing. This can be done through comprehensive, well organized, cooperatively designed programs of fishery development, and by modifying laws and regulations which lead unnecessarily to inefficiency in fishing and processing.

3.1

Establish an effective fishery development program to enable the U.S. commercial fishing industry to enlarge its share of markets through increased productivity, lower costs, and increased acceptability of fishery products to the consumer.

Projections by Synergy, Inc. referred to previously, forecast that the U.S. consumption of fishery products will increase from 1973-1985 by 2.3 billion pounds (round weight). Based on historical trends, this will be supplied largely from imports. The U.S. fishing industry should be in a position to change this trend and to supply the needed increase from U.S. landings. Further than this, it may be possible under changing world circumstances for the United States to increase its exports of seafoods substantially from landings of U.S. coastal stocks.

The factors leading to these opportunities are threefold. First, world catches are continuing to grow but at a somewhat slower rate than previously and cannot increase indefinitely. Many major fisheries appear to have reached or exceeded their maximum sustainable yields. Meanwhile world population growth continues to accelerate. The competition for the limited world supply will therefore increase and affect the U.S. import market. Second, rising fuel prices are likely to increase the costs of operating foreign distant water fleets off U.S. coasts more than those of U.S. fleets operating from nearby shore bases. Third, with the extension of fisheries jurisdiction the United States will assume primary claim to the huge fishery resources which lie within 200 miles of the U.S. coasts. In spite of these opportunities it has been argued that it may be in the interest of the U.S. consumer to continue to rely on foreign fishermen to provide for all our increasing needs.

No exact assessment is available of the impact on the U.S. economy of this course of action. However, good indications may be obtained from a study made by Centaur, Inc. on the economic impacts of the U.S. commercial fishing industry. Centaur estimated the potential maximum gains to the U.S. economy of replacing all fish imports by U.S. landings in 1973, would have been an increase of $2.97 billion in value added and 205,000 man-years of employment. This did not include the additional short term effects upon the economy associated with the added capital investment which would have been needed.

On the other hand, replacement of U.S. fishermen by foreign fishermen (replacing U.S. landings by imports) in 1973 would have meant a loss of $2.04 billion in value added to the economy, and 133,000 man-years of employment. These losses would have been somewhat less if foreign fishermen had purchased fishing inputs (operating expenses and replacement investments) from U.S. sources.

It would be fallacious to attempt to apply these figures directly to the 2.3 billion pounds increased consumption anticipated for the United States in the next ten years; but it is clear from the results presented above that the impact on the U.S. economy of providing this increase from U.S. landings would be of an order of one to three billion dollars and a hundred to two hundred thousand man-years of employment greater annually than it would be if the increase came from imports. This is a highly significant impact on the economy.

The question then becomes what should be done by Government and industry to increase U.S. production, and what are their respective roles in doing this? Some of the implementing proposals which should be considered are in the fisheries management area, which is primarily a Government function. These include restoration of resources, assurance to continuing stocks, and possible limited entry programs. They are discussed elsewhere in this document. Other suggested proposals involve development programs to increase the catch and use of species not now being fully utilized by U.S. fishermen, although sometimes utilized by foreign fishermen. Such increases would, of course, be within management limitations to avoid exceeding sustainable yields, while taking account of recreational requirements.

For the most part, the problems of fisheries development in the United States have had no more than piecemeal casual analyses at the various government levels. Successful fisheries development can be complex, and examination of only a small aspect of a total system may leave the real problem untouched. To avoid such limited strategies, fisheries development should be based on comprehensive studies of the needs of complete catch-to-market systems for particular fisheries. They must identify the impediments to growth and provide means to establish sound, self-sustaining industry programs.

If industry is to compete more successfully for domestic and foreign markets, it will have to improve and diversify its present operations. Joint government-industry fisheries development programs are proposed. These should provide the necessary technology, information, and financial support to create this opportunity. In such programs, the fishing industry, Government agencies, and universities must join together in innovative action directed toward more complete and efficient use of resources. Development and resource management should be regarded as two aspects of movement toward a single objective—the rational utilization of the resources.

Many segments of the fishing industry are unable to undertake such development alone. Many are fragmented and consist of scattered small units. Fish stocks on which they depend vary in yield from year to year. Their markets for these stocks have been subject to many years of fierce, subsidized foreign competition. As high risk industries, their capital sources demand rates of interest above those available to industry generally, and call for short term payoffs. Their financial structure has not been one able to support research and development programs on any significant scale. These limitations are especially inhibiting in the face of the sudden and massive opportunity which extended jurisdiction could present. This could overwhelm the capacity of the industry to respond, and the chance of success would be limited without substantial assistance.

The role of Government in such a development program is to provide the basic information needed, such as that on fish behavior, gear technology, the physical and chemical properties of the fish caught and their changes under various storage and process conditions, food safety requirements, etc. That of industry is to translate this fundamental information into practical means of harvesting, storing, landing and processing fish into marketable products, and to apply it commercially. At the interface, a high degree of cooperation is needed. Government must also provide continuing biological, technical, and economic information needed for follow through. A well considered and adequate program of financial assistance to enable industry to make the necessary large investments is proposed for consideration.

In view of the economic potential indicated above, it is proposed for consideration that Government make a substantial effort to assist industry in appropriate ways to develop its capability to increase its share of markets and to maintain them on its own. The opportunity exists for a comparatively modest Government effort to lay the foundations for substantial increases in growth and stability of one of the Nation's oldest industries. Such an expanded industry, based on abundant and renewable resources will make a significantly larger contribution to the economy of the Nation and to the well being of many of its coastal communities.

Fisheries development programs might include several kinds of activities designed to increase supplies through cultivation of latent fishery resources and to increase productivity:

- Status-of-stocks information obtained by resource assessment, coupled with information acquired from commercial fishery interests, provides a basis for decisions on those fishery resources that offer potential for commercial development.

- An exploratory fishing program which involves gear development, testing, and demonstration provides specific information on target species which have been identified for fishery development.
- Product and processing research is aimed at fuller utilization of fishery products having a potential demand by: (1) increasing the level of quality of fishery products available to the consumer; (2) developing acceptable new product forms; (3) improving transportation and storage of fishery products (e.g., improving the holding characteristics of the product and developing better shipping methods); and (4) improving processing methods (e.g., mechanization of shipboard and processing operations). The net effect is to use a wider variety of raw materials to make available lower cost, more varied, and higher quality products in the marketplace.
- Marketing services and trade and consumer education complement industry efforts in the introduction of such new species and new products into the domestic or foreign markets.
- Economic analysis, including market research, provides a basis for decisions throughout the fishery development process, including the evaluation of investment alternatives, the establishment of fishery development priorities, and the assessment of risks affecting investments made by the industry.

3.1.1 Enact legislation which will consolidate and strengthen programs of assistance to the fishing industry.

General authority for the Federal Government to conduct fisheries development is contained in several pieces of legislation. However, more specific legislation will reaffirm the national concern for the industry, provide means for fisheries development, and clearly delineate the Federal Government role.

3.1.2 Establish regional advisory groups to study regional needs, propose priorities for development programs, and implement such programs where appropriate through cooperative government-industry action.

Development programs implemented through joint action between Government and industry could have much potential and value. The advantages of joint industry-government ventures are that they: (1) insure that the right questions are asked from the standpoint of both industry and Government; (2) utilize commercial vessels, gear, and fishermen in fishing trials so that results are representative of what can be expected from a commercial fishing operation; (3) utilize industry facilities to test-process species, thereby quickly determining their suitability for domestic and export markets; (4) collect scientific data to permit Government to assess the management and utilization aspects of a potential fishery; (5) jointly execute programs designed to place new or additional products into the market; and (6) insure the industry will have immediate access to the data.

The concept of joint ventures does not necessarily mean a 50-50 sharing of all development costs between industry and Government. Industry may contribute to these programs in kind, by giving practical advice, donating vessel time for experimental

gear development and demonstration fishing, providing adequate samples of species for processing research, product development, and market testing, use of plant facilities for developing new or improved processing techniques and demonstrations, and participating in market testing of new products. Ultimately, industry investment will far exceed Government development funding.

3.1.3 Expand programs of fishery technology including harvesting, handling, and processing, to increase productivity and quality and decrease cost and waste.

With a few notable exceptions the fishing industry has not responded to the remarkable advances in technology which have occurred in the last 30 years. For example, blue crabs are still largely picked by hand; little mechanical handling is used on U.S. vessels. Opportunities exist to apply techniques established in other areas to sophisticated fishing strategies, to the speedier location and harvesting of fish, their mechanical handling on board and their processing into a wide variety of new and diverse products to supplement and expand the sale of traditional lines. Well designed technological improvements can not only increase productivity but increase the share in existing markets, while opening new ones to U.S. fishermen.

As new species are developed, modification and testing of new fishing gear will be needed. Shipboard handling and storage methods to maintain top quality must be determined for species which have not traditionally been taken. Freezing characteristics and new packaging requirements must be studied if quality is to be maintained throughout the marketing chain.

3.1.4 Redirect and strengthen financial assistance programs for fisheries.

The capital intensive fishing industry is generally unable to finance its production equipment in the private debt capital market over a period commensurate with the useful life of that equipment. The private capital market assigns fishing vessel financing to a high-risk category. The industry usually pays a premium cost for debt capital with shorter than justified maturities. Fishing enterprises are characterized by large fluctuations in earnings potential, which keep working capital reserves marginal and prevent accumulation of equity capital reserves for replacement of production equipment. Any attempt approaching full domestic utilization of fisheries resources within an extended jurisdiction will require extensive amounts of new capital for both the harvesting and processing sectors. This will often constitute a high-risk venture capital situation. The approach of guaranteeing private credit would be the most appropriate Government role for major capital projects. The most appropriate role for Government in the area of equity capital accumulation would be tax deferrals. Grants to stimulate research and development and low-interest long term direct loans for commercial pilot ventures in fisheries development are generally not available. A number of Government agencies provide a variety of financial programs but a comprehensive program to meet the future needs of fisheries does not exist, and should be established.

3.1.5 Provide economic and marketing information to define opportunities for the introduction and expansion of the use of underutilized species.

Broader consumer demand patterns can be developed by innovative and comprehensive seafood marketing and education programs. An effective national program is required which coordinates the skills and experience of everyone concerned in various industry, state, and Federal marketing activities. Such a program will enhance the fish marketing capabilities of the various cooperators. The development of consumer educational material which acquaints the public with the valuable nutritional qualities of fish and shellfish can do much to expand the consumption of fishery products. Likewise, educational material can inform the public of the availability of new species and product forms resulting from the development of underutilized species. Marketing efforts at all levels—Federal, state, and industry—can be guided more effectively if there is a background of basic marketing research. This would include such areas as characteristics of consumer demand and the market structure and flow of fishery products from dockside to consumer's table.

3.1.6 Provide technical assistance, grants, and loans to assist in establishing fisheries cooperatives for low-income fishermen.

Fishery cooperatives can provide the individual fisherman, who is essentially a small businessman, with economies of scale in purchasing supplies and transporting fish, a marketing organization, and tax advantages. Through a cooperative, members jointly perform and obtain services which individuals could not perform and obtain alone.

3.1.7 Undertake a comprehensive review of tariff and non-tariff barriers and their impact on U.S. trade in fishery products and recommend modifications to benefit the industry.

Under the General Agreements on Trade and Tariffs (GATT) there has been a general relaxation in world trade barriers. This has been a consistent policy of the United States since the 1930's. Tariffs have declined steadily on U.S. imports of fishery products. In 1973, the average ad valorem rate was only 1.6 percent of the value of all fishery imports. The low average rate on fishery products is because many items are received duty-free. A few items have relativoly high tariff rates with one commodity having a rate of 35 percent. In contrast, the average rate for all other U.S. imports was more than 3 times higher. Other nations of the world have not been as generous in reducing their fisheries tariffs. In recent years, many nations have actually raised their tariff rates in order to protect their fishing industries.

As the U.S. dependence on fishery imports grew over the years, several studies were undertaken to determine if economic hardship had resulted. There have been four groundfish fillet investigations before the International Trade Commission (formerly U.S. Tariff Commission). The Tariff Commission also conducted studies on canned sardines and shrimp. In addition, there were extensive Congressional hearings on shrimp imports. In half of these cases, the Tariff Commission ruled in favor of the domestic industry. But, in two of the three cases, the decision was made not to raise tariffs. Five of the six studies were conducted in the 1950's or early 1960's. Each dealt with specific fishery products. With a new round of GATT negotiations just starting, it would be appropriate to review thoroughly all tariffs affecting U.S. imports and exports of fishery products. Such a study has never been undertaken. It would be valuable for U.S.

negotiators at GATT over the next three or four years. The study should make recommendations as to how tariffs should be modified to alleviate any hardships experienced by the U.S. fishing industry as a result of other nations' direct or indirect subsidization of their fishing industries.

3.1.8 Fund development programs through apportioning 100 percent of the tariffs on imported fishery products for this purpose.

The Saltonstall-Kennedy Act of 1954 directs the Secretary of Agriculture to transfer annually to the Department of Commerce 30 percent of the gross receipts from customs duties collected on fishery products. Such funds are to be used for: (1) promoting the free flow of domestically produced fishery products by conducting a fishery educational service, and technological, biological, and related research programs; (2) purchasing, constructing, equipping, and operating vessels or other facilities for conducting this research; and (3) developing and increasing markets for domestic fishery products and to conduct biological, technological or other research pertaining to American fisheries. If this share were increased to 100 percent, funds would increase from $8 to $10 million per year to about $25 to $30 million per year based on present import levels.

3.2

Design fish management plans and revise unnecessarily restrictive regulations to permit increased industry efficiency and lower production costs.

If a fishery is managed to conserve the resource, the amount of fish which should be caught in one season will be relatively fixed by regulation. Fishermen respond to such regulations by employing fishing strategies designed to increase their shares of the fish available—by using bigger and faster boats, as in the tuna fishery, or by using more gear, as in the lobster and crab fisheries. These strategies may increase the individual fisherman's share of the catch, but they do not increase the total catch. The result is overcapitalization, a situation in which the sum of individual efforts to achieve efficiency leads to inefficiency of the total fleet, and the average cost of harvesting the fish is higher than it need be. In overcapitalized fisheries, profits are marginal, the probability of business failure is high, and the long-run prospects for fishermen to make a decent living are not good.

A solution to this problem is a limited entry program which limits the number of fishing units participating in a fishery in order: (1) to create an environment in which technological improvement results in overall gains in fleet efficiency and to society; (2) to ensure a healthy economic climate in the fishery; and (3) to terminate fishing strategies that are at odds with the goal of conserving the resources.

In a number of fisheries limited entry is not an appropriate management measure at this time. The costs of applying entry control to these fisheries would not produce equivalent benefits. There are two types of fisheries that can benefit from controlled entry. One is the traditional, well developed, higher-value fishery. The second consists of those fisheries in which a considerable growth of fishing effort may be expected in the near future.

3.2.1 Limited entry should be considered as a management tool for application to those fisheries in which overcapitalization exists or in which there is good likelihood that overcapitalization will develop.

3.2.2 Socio-economic base studies should be conducted to determine whether limited entry should be applied to each particular fishery under consideration, and to develop grass-roots understanding and support for it.

3.2.3 If limited entry is to be employed, it should be implemented by the agency responsible for managing the fishery as discussed in Section 1.6.

3.2.4 Repeal or modify existing fisheries management regulations that do not fulfill a management purpose or that impose unreasonable inefficiencies on a fishery.

To the extent possible, regulations should avoid imposing inefficiencies on a fishery. Wherever possible, they should be designed to lessen conflicts between different user groups and different types of gear. Enforcement aspects should be considered in the development of regulations. These actions will lessen the cost of management, make it more efficient, and reduce the burden and cost on the industry.

3.2.5 Give state marine fisheries agencies adequate authority to manage marine fisheries resources effectively and efficiently.

In a number of coastal states, existing laws or the lack of appropriate statutory authority limit the fisheries agency's capabilities to manage fisheries. The greatest need in some states is for the fisheries agency to have adequate regulatory authority. In these states most if not all management regulations can be implemented only by legislation, but the delay and uncertainty associated with management by legislation usually prevents effective action, since most legislatures meet for only a few months a year and in some states only every other year.

The general goal is to achieve strength and direction in management. Some coastal states need : (1) to broaden fisheries management to include economic and social as well as biological objectives; (2) to mandate, rather than simply to permit, close cooperation with the Federal Government; (3) to require licensing of resource users and adequate catch reporting; (4) to encourage advisory contributions from resource users, conservationists, and others interested in decisionmaking and regulatory processes; and (5) to establish effective penalties or deterrents to violation of regulations, with provision, where appropriate, for reciprocity with adjoining states in enforcement activities in boundary waters.

Objectives and provisions such as these are reflected in the suggested legislation mentioned earlier, the proposed "Marine Fisheries Management Act" developed by the Council of State Governments and distributed to the legislators of the fifty states. Each state fisheries agency should compare the statutory basis of its own operation with the provisions of this suggested act and seek adoption of those parts that will improve its capabilities for fisheries management.

3.2.6 Minimize the impact of unnecessarily restrictive laws and regulations on the U.S. fishing industry.

The recommendation applies to laws and regulations other than those concerning fisheries management. The growth of Government rules and regulations in the 1960's and 1970's has been considerable. Since the cost of many requirements falls more heavily on small companies, the structure of the U.S. commercial fishing industry, with its large number of small enterprises, makes it particularly sensitive to the added requirements and costs resulting from Government regulations. For example, the Environmental Protection Agency (EPA) has stated that 38 percent of all fish processing plants should be exempted from its effluent limitation guidelines because these plants would go out of business if forced to meet its requirements. Even with these exemptions, EPA estimates that 16 percent of all plants will be forced to close because of its regulations. Not only do new requirements add substantially to operating costs directly, but they divert increasing amounts of company time, funds, and effort from their primary function. This is further compounded by the fact that regulations from different agencies frequently conflict, and that means to resolve the conflicts are inadequate. In particular, requirements of safety, public health, and waste disposal are at times incompatible in both principle and application. No mechanism exists to assess the total impact of all rules and regulations on the seafood industry. Individual regulations by themselves may have relatively little impact; however, the cumulative effect could be significant on a large segment of the seafood processing industry.

TO IMPROVE MARINE RECREATIONAL FISHING OPPORTUNITIES

Recommendation 4.

Improve opportunities for participation in marine recreational fishing.*

4.1 Expand and accelerate research needed for the improved management and use of recreational fisheries, and improve the distribution of information thus obtained.

4.2 Increase the amounts and kinds of fisheries resources available for recreational use.

4.3 Increase access for recreational fishermen and others to shorelines, waters, and fish.

4.4 Determine the needs of commercial enterprises for assistance in developing access, facilities, and services upon which marine recreational fishermen depend.

Marine recreational fishing, which here includes the harvesting of shellfish as well as finfish for personal use, has become a major marine activity in the United States. Supplying supporting services and products has become a major industry. Programs are needed to ensure that the rapid increase in demand and effort do not decrease satisfaction of marine fisheries recreation, or limit future marine recreational opportunities.

The starting point is in broadening the presently limited knowledge and understanding of the factors affecting the well-being of stocks of fish presently or potentially of interest to marine anglers. Such information is urgently needed to ensure the maintenance of stocks, their fair allocation to all users, and their use and appreciation by anglers. To avoid increasing congestion, additional shoreline and marine access for fishing must be developed, making opportunities available to as many geographic, economic, and social groups as possible. This policy is especially important in coastal metropolitan areas where access to shorelines and waters is limited, and where recreational opportunities are most needed. However, care must be taken that development of recreational access is undertaken in an ecologically sound manner that fully considers the preservation of estuarine and shoreline habitats.

Few studies have been made of the social and economic values of marine recreation. Such studies are needed to permit a better evaluation of the relative economic contribution and social benefits of marine recreation. Present funding arrangements for fishing facilities and research management programs are inadequate. The development of programs to provide better and more enjoyable fishing to more people, now and in the future, will require additional funds. Fishermen must help through the purchase of licenses, to meet the costs of providing the benefits they receive.

*In all subsequent uses in Recommendation 4 the words fishing, fishermen, fishery, or anglers mean "marine recreational fishing" or "marine recreational fishermen" unless otherwise qualified.

Volunteer assistance of fishermen and their organizations in research, development, and environmental monitoring could further contribute to the well-being of the environment and the living resources fishermen enjoy. Such assistance programs should be developed and used wherever feasible. Findings of research should be prepared in popular forms. These should be speedily distributed, not only to resource managers to conserve the resources better and to optimize the use of the resources, but to anglers, commercial fishermen, conservationists, and the general public, to increase public understanding, knowledge, and enjoyment.

Information for development of additional fishing opportunities and the improvement of services should be made available by resource management and economic development agencies to the private sector to enable them to serve the public better. Consideration should also be given to extending existing financial assistance programs to economic activities that support the activities of anglers.

Other social benefits derived from living marine resources are enjoyed by many people who do not participate in angling, but are concerned about conservation of all living marine resources, and the maintenance of the marine ecosystem. Fisheries management agencies must be aware of these other social benefits and concerns, and manage the utilization and conservation of fisheries resources on the basis of consideration of whole marine ecosystems.

4.1

Expand and accelerate research needed for the improved management and use of recreational fisheries, and improve the distribution of information thus obtained.

4.1.1 Increase biological research on rpcreational fishes and their ecology, develop information in suitable forms, and distribute to resource managers, fishermen, and the interested public.

Better and more extensive biological information on marine recreational fishery populations will improve management, utilization, and conservation of these resources. Where stocks are subjected to competing uses, understanding of the complex interrelationships will improve regulation of multiple fisheries, minimize conflicts between competing users, and help the general public to understand better the principles and effects of management policies. Stocks that could provide greater fishing opportunities can be identified as possible targets for fishermen. This will not only increase recreational opportunities, but help relieve pressure on local, heavily-fished stocks, and utilize available stocks more effectively and fully. The necessary research should be conducted as part of the arrangements discussed in 1.4. Much of the research information now produced is available only to scientific and management audiences. Ready and prompt access to it

in popular forms by fishermen and others will greatly increase its use, and the enjoyment of fishing. A significant responsibility for this could be undertaken by Sea Grant universities and the associated marine advisory service.

4.1.2 Establish and maintain a national statistical base on recreational fishing, including participants, their fishing efforts, catches, expenditures and the disposal of their catches.

Insufficient information is available on the effects of recreational fishing harvest on the stocks to permit management for optimum recreational opportunities and benefits. Data are needed on the numbers of anglers; fishing effort in terms of angler-days, the locations and methods of these efforts; catches by species, numbers, and sizes; direct expenditures for fishing at the fishing sites and indirect expenses elsewhere; disposition of catches (released alive, tagged and released, eaten, sold, given away, or wasted); and perhaps information on the satisfaction and fishing preferences of anglers of different backgrounds, ages, and locations. All this information will greatly assist management agencies in responding to fishing needs and using the productivity and benefits of marine fishery resources most effectively. The design and execution of the surveys of fishing activities should be coordinated on a national basis to ensure comparability. In cases where efforts must be increased to meet additional Federal requirements for information, the extra costs should be supported by supplemental Federal funding.

4.1.3 Develop and maintain valid and current economic evaluations of recreational fishery resources, activities and potentials.

Improved measures of the economic values of activities associated with marine recreational fishing are needed for environmental and resource management decisions. This information is important in the development of management plans, especially where conflicts between competing resource users must be resolved. These measures must be coordinated nationally for uniformity and applicability by Federal agencies in close cooperation with state agencies and academic researchers.

4.1.4 Develop a nationwide cooperative State/Federal licensing system for marine fishermen, as discussed in 1.8.2. The income should be allocated to the state and Federal management agencies.

Programs to meet the needs and wishes of marine anglers are low on the priority lists of many marine fishery agencies. This is partly due to lack of information on how important angling is to how many people, but primarily to the absence of adequate funding to undertake such programs. Additional funding is proposed for recreational research, and management, purchase of shoreline properties, construction and maintenance of adequate facilities, securing improved access, and other programs to maintain and enlarge marine recreational opportunities.

A nationwide cooperative State/Federal licensing system for marine recreational fishing will not only provide improved documentation of anglers, it will assist in funding these benefits needed by anglers.

It is estimated that an annual license fee equal to 2 or 3 percent of the annual expenditure of the average marine angler will provide sufficient funds to pursue many of the programs necessary to maintain angling opportunities and satisfaction.

A uniform registry of licensed marine anglers, not now available, also will provide more equitable allocation to marine recreational fisheries of the taxes levied on all fishing tackle sold in the United States under Federal Aid in the Fish Restoration Act (16 U.S.C. 777-777K). All states require licenses for fresh water angling, but relatively few for marine angling. Thus some states with large but uncounted marine angling populations do not receive an equitable portion of the funds which are allocated from this source on the basis of the number of anglers licensed in each state. Reciprocal recognition of the licenses of neighboring states in all interstate border waters should be considered.

4.1.5 Enlist the aid and participation of marine recreational fishermen and their organizations in research, development, and environmental monitoring programs.

Voluntary involvement of concerned fishermen and their organizations in certain aspects of research programs could provide valuable assistance to fisheries agencies. Such activities could include catch-tag-and-release of game fishes, the early reporting of environmental disturbances, gathering of participation and catch data. In special instances, physical help might be given in research programs and developing facilities such as artificial reefs, boat-ramps, and shoreline fishing sites. The feedback to the volunteer fishermen of the results of their efforts must be assured. The capability for this already exists in the Marine Advisory Service.

4.2

Increase the amounts and kinds of fisheries resources for recreational use.

4.2.1 Insure that management agencies give full consideration to recreational interests in allocating resources.

Fisheries management agencies should give consideration to the increased recreational uses of marine resources. Since approximately 90 percent of marine angling and personal-use shellfish harvesting occurs in state territorial waters and shorelines, most of these considerations will be at the state level. In addition, important recreational target species migrate into international waters, especially the billfishes, tunas, salmons, and many others that spend part of their lives in offshore waters. Many of these stocks will be managed by the recommended Regional Fisheries Management Organizations. Management decisions must be preceded by opportunities for all interested parties to present their viewpoints. (See also Recommendation 1.3.3.)

4.2.2 Improve the abundance and availability of recreational fishes by use of aquaculture, transplantation, artificial reefs, and other management techniques.

In specific instances and locations, application of one or more of the above techniques could be used to augment the abundance and availability of recreational fish stocks. In locations where environmental conditions have deteriorated, in highly industrialized harbors for instance, transplantation of fish and shellfish may help replace lost resources. If environmental qualities have been restored, efforts to reintroduce the former resident species can be undertaken. If the environment has been permanently changed, introduction of other species that can accept or adapt to the existing environmental conditions can be considered. In every case, full and critical evaluation of all possible effects must precede such introductions.

Additional artificial reefs, especially in accessible nearshore locations, could provide more opportunities for angling and improve resource productivity. In the artificial propagation of some anadromous and migratory species, selection of stocks with unique migratory habits may provide additional fishing opportunities over longer periods of time, and prevent exposure of the fish to competing harvesters. The improvement of habitat considerations, discussed in Policy Thrust 2, can play an important part in improving the abundance of recreational target species and the esthetic qualities of marine recreational opportunities. Such projects should be undertaken through the cooperative efforts of appropriate regulatory and developmental agencies and all interested parties. Federal funding should be considered to assist in initiating cooperative programs. The states involved should then gradually assume the major portion of the support in their continuation.

4.3

Increase access for recreational fishermen and others to shorelines, waters and fish.

4.3.1 Develop an up-to-date national inventory of marine access and supporting facilities.

One of the major limitations to optimum recreational use of marine fishery resources is inadequate information on where they are, and how they can be reached. Surveys of available public access areas by number, location, and description should be continued or initiated where needed, on a cooperative basis by state, Federal fisheries or recreational-management agencies or by private organizations involved in recreation and travel. The results should be distributed by public agencies or the private communication media, as appropriate, for use by fishermen and other marine recreationists. This information would also provide a basis for determining use patterns, future needs, and where best to develop additional access.

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4.3.2 Develop and maintain additional public access.

Access to publicly owned shorelines is frequently restricted. The reasons for such restrictions should be reevaluated and, if not now valid, the areas should be opened and developed for recreational fishing. Access is especially needed in or near densely populated cities, and especially for the use of juveniles, the elderly, the physically handicapped, or the economically limited, who cannot travel to other areas for recreation. Public works such as highway bridges, levees, and breakwaters, could be modified to provide fishing sites. Public docks should be developed and maintained as safe fishing sites.

State agencies with responsibilities for developing and maintaining shoreline access should be encouraged and aided in their efforts to provide additional access. Development of artificial reefs in the immediate vicinity of these access areas and fishing sites should be part of the overall plan. User fees to support development and maintenance of access facilities could be considered where general funding may be insufficient.

4.4

Determine the needs of commercial enterprises for assistance in developing access, facilities, and services on which marine recreational fishermen depend.

4.4.1 Inventory commercial operations providing services to marine recreational fishermen and evaluate their contributions to local and national economies.

Establishing sound management policies and decisions in respect to recreational fisheries is limited by a lack of information on the economic aspects of the expenditures of fishermen and the contributions to the economy of the commercial enterprises supporting them. More complete and accurate information is needed to provide a basis for rational and equitable management decisions.

To insure national uniformity and application, surveys to obtain such information should be designed and initially funded by a Federal agency, working closely with the Regional Fisheries Management Organizations. They should be conducted by appropriate state agencies or through federally funded contract studies when states cannot undertake them.

4.4.2 Determine whether assistance to the private sector is needed to supplement public access, support facilities, and services.

Most fishermen rely on supporting services and facilities provided by the private sector. In many localities where public access and facilities are overcrowded during the fishing season, opportunities exist for the private sector to absorb part of this additional demand without adding to the taxpayers' expense.

Appropriate state and Federal agencies should cooperate in studies to determine the needs for additional developments, the kinds that could be provided by the private sector, and how and to what extent management and development agencies should assist.

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Recommendation 5.

Ensure the availability to the U.S. consumer of supplies of wholesome fishery products from U.S. sources sufficient to provide for projected increases in consumption.

5.1 Increase U.S. commercial landings by 2.3 billion pounds by 1985 to provide for the projected increases in U.S. consumption.

5.2 Encourage the development of public and private aquaculture for selected species of fish and shellfish.

5.3 Assure the wholesomeness and identity of fishery products to U.S. consumers through a comprehensive program of inspection of U.S. and foreign production facilities and supplies.

5.1

Increase U.S. commercial landings by 2.3 billion pounds by 1985 to provide for the projected increases in U.S. consumption.

This recommendation addresses the sources of supply which are now or can be made available to meet future increases in U.S. consumption. It identifies the actions designed (fish stocks sufficient) to enable U.S. harvesters to increase landings by 2.3 billion pounds in the next ten years. It makes the following assumptions: In the near future with the extension of U.S. fisheries jurisdiction the United States will be given the responsibility for conservation and management of stocks out to 200 miles from shore. It will manage its fisheries resources to ensure their full conservation and provide exclusive or preferential treatment for U.S. fishermen. Other recommendations of the National Plan relating to management, development, recreation and environment will be implemented.

It does not take into account the significant contribution made to the food supply through marine recreational fishing, since consumption statistics now available are based on the commercial supply. It should, however, be noted that, according to saltwater angling surveys, recreational fishermen land an amount of fish equal approximately to 7½ pounds annually for each person in the United States. It is likely that much of this fish is eaten and so adds to the overall food supply.

To match the potential U.S. supply and demand the following factors are considered: the present sources of supply of fish and fishery products to U.S. consumers; the projected increased U.S. needs for food and recreation; and the potential U.S. catches of fish in U.S. waters and in distant-water fisheries of interest to U.S. fishermen. Based on the foregoing, the potential sources which could contribute to future U.S. needs are reviewed. Table 4 at the end of this section summarizes these factors.

How Much More Fish Will The United States Need In 1985?

Synergy, Inc., projected an increase in the annual U.S. consumption of fishery products from 1973 to 1985 of 2.3 billion pounds on a round weight basis. This single target was broken down into "market classes" of fishery products, classes of products having a similar identity, within each of which an interchange of products can be accomplished fairly readily.

This is necessary because there is a spectrum of demand. The consumer of a premium product such as lobster is unlikely to be satisfied with fish sticks. Another consumer may seek products of lower value because these are all he can afford. Future increases in consumption must therefore be considered not only in total but also in terms of market classes. The Synergy study provides forecasts of consumption of edible fishery products in eleven such classes.

Table 4 lists the major market classes. It shows U.S. consumption for each in 1973 from U.S. landings and imports, and projected increases for food and recreation by 1985. In a number of cases estimates for the increases in recreational needs are not available, but it is assumed that they will be significant in amount.

How Can The Increases Be Supplied From U.S. Landings?

It has been noted that increased supplies of fish and fishery products can come from several sources. Consideration of these must take into account the need for measures to retain as much as possible of present supplies while developing new opportunities. The potential sources are:

1. Harvesting part or all of the stocks now caught off the United States by foreign fishermen.
2. Developing fisheries and markets for species now underutilized.
3. Restoring depleted stocks.
4. Developing commercial and public aquaculture.
5. Developing and expanding international arrangements outside the 200-mile zone to assure continued opportunities for U.S. fishermen on the high seas and, where possible, in other countries' jurisdictions.

Development of these potential sources is the subject of recommendations

elsewhere in this plan and such sources will be dealt with here only as they represent possible contributions to future needs.

The first objective of Recommendation 5.1 is to hold imports at the present level and to meet future U.S. demands from domestic sources. It is not suggested that there be no increases in imports of any fishery product, but rather that overall imports be held to no more than the present level. In some cases, notably those of tuna, shrimp, and lobster, it may not be possible to increase U.S. landings to the extent required. In other cases, further efforts may be needed to offset potential decreases in present supplies.

Table 4 shows by market class the U.S. catches inside and outside the 200-mile zone and the foreign catch within 200 miles of the U.S. coasts. An estimate of the aggregated MSY is given for each class. It is recognized that MSYs are in many cases only approximate estimates and that fisheries are subject to considerable annual variations. MSYs of different species are not always additive due to interactions and, furthermore, other considerations enter into regulating the catch in any fishery. However, they are used here since they provide the only available estimate of biological resources limitation. Finally, the table shows the potential sources referred to earlier for projected increases by market classes.

The following brief summaries by market classes indicate the general potential of U.S. fisheries to contribute to our future needs. Also considered are some of the problems that may be encountered in increasing supplies from these sources for food and recreational uses. It is important to reemphasize that the proposals for increased catches go hand-in-hand with the need for adequate management plans to ensure the continued conservation of the fish stocks, and that they keep in mind the increasing demands of recreational fishing.

Groundfish

The estimated increase needed by 1985 is 1.42 billion pounds including 340 million pounds for recreational purposes. By eliminating all or a portion of foreign fishing and by developing underutilized species, ample resources are available to meet the projected increases. Some species such as cod, haddock, and certain flatfishes could provide 250 million pounds to the premium groundfish market following stock restoration. Other major potential sources are Alaska pollock and flatfish (4.7 billion pounds); North Pacific groundfish (350 million pounds); and Gulf of Mexico groundfish (1.1 billion pounds).

Halibut

The estimated increase needed by 1985 is 40 million pounds. Because most of the halibut caught incidentally by

foreign and domestic trawls are below the optimum size, the MSY—even under an efficient management regime—will be less than previously attained by the North American setline fishery. With efficient management of trawl fisheries and the expected benefits from present management of the setline fishery, a 40 million pound increase is anticipated but the restoration is not likely to be completed by 1985. Approximately half of this amount will be caught by U.S. fishermen, the remainder supplied through imports, mainly from Canada.

Tuna

The estimated increase needed by 1985 is 370 million pounds, assuming that present supplies also remain available. This increase includes 30 million pounds for recreational purposes. The U.S. catch in 1973 was 515 million pounds; imports were 1.5 times this. Although the catch has increased, the U.S. share of the yellowfin caught in the Eastern Pacific has declined from 90 percent in 1966 to 68 percent in 1974, due to increased fishing efforts by other nations, and is projected to decline further. The outcome of the Law of the Sea Conference or other negotiations and the implementation of any resulting agreements are uncertain. The chances of increasing present catches in this area are not high and losses are possible.

The biggest opportunity to expand tuna landings is in improving knowledge of skipjack tuna resources in the Pacific, Atlantic, and Indian Oceans and in developing means of locating and harvesting these resources. A potential catch of over 2 billion pounds annually has been estimated. Expansion of efforts such as those now being made under the Pacific Tuna Development Program should help to develop a U.S. fishery for these resources which could realize at least a part of future needs. The present Pacific Island Development Program is aiming to increase catches by 200 million pounds as a first step. It also is estimated that increases in landings of Pacific albacore of 30 million pounds may be possible.

Salmon

The estimated increase needed by 1985 is 90 million pounds, including 30 million pounds for recreational purposes.

Salmon stocks are currently under scientific management which generally maintains such stocks at MSY levels. These levels have fallen due to habitat degradation, mainly by dams and logging, but levels could be raised by expanded management actions such as stream improvement and stock manipulation, plus expanded public hatchery production and increased production by private aquaculture. Such actions could increase publicly generated salmon supplies by 30 million pounds and those from private aquaculture by 60 million pounds annually. These increases would require major investments.

Scallops

The estimated increase needed by 1985 is 13 million pounds. Resources presently available to U.S. fishermen are sufficient to provide for projected increase if mechanical shucking of calico scallops can be perfected and the distribution and abundance of this resource can be monitored. Restoration of the Northwest Atlantic sea scallop resource through proper management would also contribute to the expected increase in consumption.

Shrimp

The estimated increase in demand by 1985 is 245 million pounds. In 1973, the U.S. catch was 392 million pounds while imports totaled 203 million pounds. An estimated 40 million pounds now landed by U.S. fleets in other countries probably will be caught by foreign vessels in 1985 if some long term accommodation is not reached.

The estimated unfished shrimp resources off the United States amount to 277 million pounds, but much of this is small, lower-value pandalid shrimp which would not automatically satisfy the demand for the larger penaeid shrimp. Increased aquaculture offers a prospect of 15 million pounds of marine shrimp and 10 million pounds of freshwater shrimp by 1985 if the technology and economic production systems can be developed rapidly. These sources alone will not meet future demand and imports of shrimp will need to be increased.

Lobster

The projected increase needed by 1985 is 40 million pounds. Inshore lobster resources are probably being overexploited. Offshore lobster stocks have declined from virgin condition, but the extent of decline is not yet clearly documented. The development of a technically and economically feasible culture system which would produce substantial poundage by 1985 has a low probability. Only small increases in imports are likely. Although the future increases might be met, in part, by imports of Northern and spiny lobsters, increases in supplies will not be sufficient to meet the projected consumption level.

Crabs

The estimated market increase needed by 1985 is 10 million pounds. The 1973 U.S. catch was 292 million pounds of all crabs. Foreign catches off the U.S. in 1973 totaled 70 million pounds. The estimated MSY for all species is 515 million pounds, leaving a maximum potential increase of 220 million pounds annually when the U.S. jurisdictional limits are increased to 200 miles. High cost is now the limiting factor and more efficient processing is needed to lower costs and increase yield. As costs are reduced, markets can be expanded.

Clams

The projected increase needed by 1985 is 40 million pounds annually. The estimated MSY is 250 million pounds. Present landings provide 106 million pounds. However, most of the traditional stocks which can be legally taken are fully utilized. Large quantities of clams are presently unavailable along the middle and north Atlantic coasts because they are in polluted waters. Large stocks of clams along the shorelines in Alaska are not being utilized because of paralytic shellfish poisoning (PSP), and others on the continental shelf off Alaska have never been utilized because of difficult logistics and uncertain economics. Private aquaculture might add 7 million pounds by 1985, given research on culture systems, quality control, and favorable zoning decisions. U.S. supplies exist in abundance to meet needs if certain actions are taken.

Oysters

With a concerted distribution and marketing effort by industry to make high quality oysters readily available throughout the United States, it is projected that future consumption could increase by 20 million pounds.

Production from wild stocks could be increased somewhat in the Atlantic and the Gulf. However, by adapting private aquaculture methods used in other countries, U.S. oyster production could be increased by 80 million pounds of meats by 1985. Major needs are information on genetic improvement of stocks and disease control, development of economical culture systems, improved product forms and markets, and availability of space for oyster culture in clean environments.

Miscellaneous Species

The ten market classes previously discussed cover the most popular species. There are, however, species used in smaller amounts which collectively account for about a fifth of present U.S. consumption. The estimated increase in these other species needed by 1985 is 400 million pounds. Present foreign catch in U.S. coastal waters of species other than in the ten market classes is over 2 billion pounds annually, while the United States landed a total of 533 million pounds in 1973.

Aggregate MSY estimates vary greatly, but the total is at least two or three times more than the present catch. Ample stocks exist to meet projected increases, but they include species which are not in great demand because of a wide range of technological or marketing problems which vary from species to species. Progress is being made in solving these problems but efforts will have to be substantially accelerated.

Fish Meal and Fish Oil

The United States produced 586 million pounds of fish meal in 1973, of which 66 percent came from menhaden. Tuna and mackerel scraps accounted for 15 percent, herring for 1 percent, and a mixture of other species 18 percent. Imports in 1973 totaled 676 million pounds, primarily in anchoveta meal. The Synergy forecast indicating an increase in consumption of fish meal of 669 million pounds by 1985 is probably high due to changes in utilization patterns occuring since 1973.

It is believed that menhaden are harvested at MSY. To boost production, alternative resources will have to be used. The currently regulated California anchovy fishery appears to be the most promising unutilized resource to serve as the base for expanded fish meal production. Current MSY estimates of the virgin anchovy stock range from 1.5 to 5.3 billion pounds. With a 20-percent yield factor for fish meal, this fishery could provide from 30 million to 1.1 billion pounds of meal, enough to cover the anticipated increase in demand.

The major constraint in commercial development of the California anchovy resource is the interest of the recreational groups in anchovy as a bait fish and as food for game fish. Significant increases in domestic fish meal production may be possible if adequate biological information is developed to demonstrate that larger harvests will not impair the ecology upon which recreational species depend.

The United States produced 225 million pounds of fish oil in 1973, of which 200 million pounds came from menhaden. Almost all of this was exported. Since oil is a by-product of fish meal production, increased production of oil is linked to the expansion of fish meal production.

Conclusions

Fisheries resources available and potentially available to the Nation are estimated to be sufficient, not only to meet the Nation's own projected annual increase of 2.3 billion pounds by 1985, but also to support the future growth of exports of seafood products.

Such assurances are predicated, however, on certain assumptions. One is that U.S. fishermen will be taking a larger proportion of the fish presently harvested by foreign fleets off U.S. coasts. Another is that the United States will be developing its fishing for species currently underutilized. Increased landings of groundfish, scallops, crabs, and miscellaneous species will alone account for 1.8 billion pounds.

Potentials for additional increases lie in the directions of aquaculture and restoration of depleted stocks, but in each instance the prospects for success are related to the success in working out hard questions ranging from the ecological to the economic. Meanwhile, aquaculture seems capable of meeting the predicted increases in demand for salmon (90 million pounds) and oysters (20 million pounds) and portions of the necessary increases in shrimp (25 million pounds) and clams (7 million pounds).

In summary, essential resources exist and are available for catching or cultivation in the coming decade. The catching and the cultivation depend upon the strength of the determination to make them national objectives and the zeal and resources with which the associated problems are attacked and solved.

Table 4. Present and Estimated Potential Supply of Edible Fishery Products in the United States (million pounds round weight)

	Groundfish	Halibut	Tuna	Salmon	Scallops	Shrimp	Lobsters	Crabs	Oysters	Clams	Misc. Species
				1/					1/	1/	
Consumption—1973											
U.S. landings	404	24	515	213	9	372	40	292	49 2/	106	533
Imports	1680	17	906	22	20	385	165	19	14	4	1560
Total	2084	41	1421	235	29	757	205	311	63	110	2094
Projected increase by 1985											
Food	1080	40	340	80	13	245	40	10	20	40	400
Recreation	340	3/	30	30	3/	3/	3/	3/	3/	3/	
Total	1420	40	370	80	13	245	40	10	20	40	400
Production—1973											
U.S. Catch											
Within 200 miles	404	24	45	213	9	355	35	292	49	106	419
Outside 200 miles	0	0	470	0	0	37	5	0	0	0	59
Foreign catch within 200 miles off U.S. (1973)	5650	0		0	9	95	0	70	0	0	2050
Estimated MSY within 200 miles off U.S. 4/	7500	40	2000 3/	320	35	800	40	510	130	220	12000
Sources for U.S. increase by 1985											
(1) Displace Foreign Fishing	1420	0	0	0	0	0	0	0	0	0	400
(2) Underutilized Species		0	370	0	13	50	0	10	0	25	
(3) Restc.) Resource	0	20	0	0	0	0	0	0	5	10	
(4) Aquaculture	0	0	0	80	0	25	0	0	15	5	
(5) Imports	0	20	0	0	0	170	5	0	0	0	
(6) Not Attainable	0	0	0	0	0	0	35	0	0	0	

1/ Meat Weight
2/ Includes 20 from Aquaculture
3/ No figure available
4/ It is recognized that in some cases downward adjustments might be needed to take interactions and safety factors into account
5/ MSY of Skipjack in Pacific and Indian Oceans

5.2

Encourage the development of public and private aquaculture for selected species of fish and shellfish.

Aquaculture includes any means of artificially increasing the yield of aquatic species through culture and husbandry, from public salmon hatcheries to private oyster, catfish, or shrimp farms in marine, estuarine or fresh water environments.

In the United States, public aquaculture of salmon began a century ago and about one-quarter of the Nation's salmon originate in hatcheries. Private aquaculture produces 40 percent of U.S. oysters, half of the catfish and crawfish, and nearly all of the trout for a total of 143 million pounds. This is about 3 percent of U.S. landings or 1.4 percent of U.S. total consumption of fishery products.

It was noted in the previous recommendation that landings of some highly preferred species of fish and shellfish have reached the maximum sustainable yield level. Also unless extensive environmental improvement occurs, future increases of oysters and clams cannot be obtained from natural stocks.

Attention should be turned to aquaculture as a means of extending production of species such as salmon, oysters, penaeid shrimp, American lobster, clams and scallops. In other cases lower-cost products could be made available by aquaculture of fast-growing herbivorous species in brackish or fresh water, and application of new processing techniques.

5.2.1 The Federal Government should conduct or sponsor research development, and other programs to provide a sound basis for public and private aquaculture.

Many of the concepts and techniques that have made private aquaculture possible in the United States have resulted from research and development either conducted by the Federal Government or sponsored by it in universities, mostly by way of the Sea Grant program. Commercial trout culture became possible as a result of Government research and development for public hatchery programs, which solved major nutrition and disease control problems. In 1954, 1.4 million pounds of trout were produced in private fish farms; by 1973, production was about 30 million pounds.

Similarly, Government salmon culture has provided a solid technological base for private salmon farming. When Government researchers developed techniques for pen-rearing of salmon, the result was immediate interest by industry and more than ten companies have begun private salmon farming. The hatchery production of oyster larvae is largely attributable to research and development at Government laboratories that began more than thirty years ago.

Federal action is proposed to conduct or fund research and development which will provide a sound basis for aquaculture of selected species; to take national action to maintain suitable environments; to reduce legal

and institutional problems that limit aquaculture; and to assist the established aquaculture industry to solve long range problems or emergencies beyond their capabilities to handle. Action is proposed to encourage Federal agencies, the states, local governments, the academic community, and the private sector to cooperate and participate in the development of aquaculture.

It is also important to encourage early commercial application of research results by providing scientific and technical information to the aquaculture community as a whole through publications, workshops, and advisory services.

5.2.2 States should establish laws and policies to encourage private aquaculture, maintain suitable environments, and operate hatcheries for stocking public waters with selected species.

Since states have a responsibility for resource management within given jurisdictions, they have a significant role in the development of aquaculture. Several state fisheries agencies and universities have ongoing projects to encourage private aquaculture. Some of these programs are carried out entirely with state funds; others are partially funded by Federal agencies.

Efforts of state fisheries agencies are generally on short term projects of immediate importance. It is difficult for them to fund long term or basic research in areas such as disease control, genetics, physiological studies or nutrition which have wide geographical application. A major role of the states is to establish laws, policies, and administrative procedures to encourage aquaculture, to operate hatcheries for stocking public waters, and to maintain high quality environments in bays, estuaries and coastal waters.

5.2.3 Private industry should develop efficient systems to produce high quality products and expand markets.

For some species such as oysters, trout, and catfish, aquaculture methods are well known and production can be readily increased, although solutions are needed to long range problems such as disease control and genetic improvement of stocks to reduce production costs.

For other species, research is required to provide adequate biological and technological information for development of private aquaculture. Private companies often are unwilling or unable, however, to conduct basic research or development because of the uncertainty of results, the need for specialized facilities and capabilities, and the potential for few patentable discoveries.

Since the expected private returns from investment in research and development are low in relation to alternative investments, it is unlikely that adequate research and development would be forthcoming at the proper time if left to the private sector.

Even so, estimated industry expenditures during the past five years for research and development include over $22 million for marine shrimp and freshwater prawns, over $4 million for salmon and over $6 million for oysters and clams. Some of these expenditures represent contributions to joint programs with Government or universities, but most are for direct industry efforts. Further efforts by industry are needed to develop cost-effective production methods, to assure high quality and consistent supply of products, and to expand markets.

5.3

Assure the wholesomeness and identity of fishery products to U.S. consumers through a comprehensive program of inspection of U.S. and foreign production facilities and supplies.

Present supplies of seafood products, while generally acceptable, are sometimes variable in quality and on occasion have endangered public health. This is of concern both to the consumer, who is entitled to food that is safe and of acceptable quality (i.e., wholesome), and to the producer, whose business is diminished by lack of consumer confidence in fishery products. All other animal protein foods are produced and marketed under legislated mandatory inspection programs specifically designed to meet their particular needs and characteristics and conducted as a public responsibility with public funding.

The safety and consistent quality of fishery products can be best ensured by the establishment of a broad, comprehensive, mandatory fisheries inspection program. The program should be designed to take maximum advantage of existing capabilities in Federal and state agencies, in other governments, and in industry so that it is operated uniformly, economically, and efficiently. But it must maintain an adequate level of inspection to achieve its purposes.

A national inspection program for fish and shellfish products sold in the United States should:

1. Assure compliance of both domestic and foreign facilities by maintaining adequate inspection levels.
2. Provide continuing assurance of product wholesomeness.
3. Establish for the guidance of consumers uniform and clearly identified levels of product quality.

Such a program should be introduced in a way that will not disrupt industry unnecessarily. It is recommended, therefore, that a national mandatory inspection program be preceded by a transition period to enable the necessary adjustments to be made by Government and industry both domestically and abroad.

5.3.1 Integrate and expand present Government and industry programs to improve and increase inspection of vessels, processing plants, and products in commerce to prepare for a smooth transition to a national mandatory program of inspection of seafoods.

This would be an interim action, pending enactment and implementation of comprehensive, mandatory seafood inspection legislation. It would entail the expansion and integration of all existing Federal regulatory and voluntary inspection programs for fish and shellfish with related activities of industry, the states and foreign countries. It should be directed toward eventual systematic inspection of all fishing vessels, processing establishments and products in commerce. This action should include the supporting programs needed to develop standards for the safety and wholesomeness of seafoods.

To expand and integrate the continuing activities, a work-sharing system should be devised with appropriate responsibilities and roles clearly delineated for the Federal Government, State and foreign governments and the industry. Consumers should have an appropriate role in the processes of establishing policies, quality standards, etc.

5.3.2 Introduce and implement legislation for mandatory inspection of seafoods entering, processed, and sold in the United States, with a five-year preparatory period.

NOAA, in cooperation with the other Federal agencies involved, should draft and submit new seafood inspection legislation for consideration by Congress. In the interest of program uniformity and effectiveness, a single Federal agency should be given overall authority for the national program. The agency should be responsible for all policies, standards, and controls within legislated limits. This would achieve uniform policy and administration with respect to all seafood inspection and thereby avoid duplication of effort. Fishery products, with certain exceptions, primarily ante- and post-mortem inspections, require controls during handling, processing, storage and distribution comparable to the controls provided for red meat and

poultry. The U.S. Department of Agriculture, which conducts these programs, would be one logical choice as the implementing agency. An alternative is to locate primary responsibility for seafood inspection in the Department of Commerce, which now is charged with the execution of programs that deal with most facets of commercial fisheries, including the ongoing USDC voluntary seafood inspection program.

The primary responsibility for implementing the national inspection policies, standards, and controls called for in this legislation would rest with the industry, using its own quality control systems as the primary mechanism. These industry efforts would be monitored for their effectiveness in insuring compliance with such established requirements. States and the Federal Government would monitor and verify the industry's performance and compliance on a cooperative work-sharing basis. Foreign government agencies would be required to institute approved and verified inspection systems for imports. Finally, the public would be informed of the efforts, to provide them with buying information and assure their confidence in seafood products.

5.3.3 Develop simple, practical, and enforceable quality standards for fishery products at the vessel, processing, and retail levels.

Standards of quality must be sufficiently specific to offer consumers clear choices among products of the same kind. They must be capable of enforcement at all points. They must be understandable by the consumers as well as by the trade.

To assure national uniformity and consistency, quality standards should continue to be developed by a single Federal agency—the Department of Commerce. Use of the standards should continue to be voluntary. Advice should be sought from consumers and from industry to determine their requirements and preferences, and retain product surveys used to identify problems with respect to existing standards.

To encourage fishermen to produce and market products of consistently high quality, and to provide economic incentives for doing so, new national quality standards for grading fresh fish at the dock should be established. Such standards should be developed by the Federal Government with advice from the states, industry, and consumers. Maintenance of the standards might be made the responsibility of states having the interest in and capability to participate in the program, their participation supported by use of adequate matching funds. Where such programs were in effect, prices paid to fishermen for their catches could be scaled to the quality, thus adding an important and necessary incentive to produce high quality fish.

5.3.4 Complete the development of and implement a uniform national system for assigning market names for fish and fishery products.

This activity has been commenced by NOAA, should continue to be developed with advice from Federal and State Governments, industry, and consumers. The Department of Commerce would assume primary responsibility for development and management of the system in cooperation with other concerned agencies.

5.3.5 Educate the distributing trade and consumers on the factors affecting quality and the significance of inspection marks in identifying quality.

A national education effort is proposed. This effort would be conducted primarily by industry, using information and concepts developed by the Federal Government in cooperation with industry and other interested parties. It would be aimed at minimizing losses in quality during both the distribution and use of fishery products, and at enabling consumers to make informed choices among fishery products offered for sale.

IMPLEMENTATION
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The National Plan exists because NACOA, surveying the condition of the Nation's fisheries from the perilous prospects of the resources and the disparities between production and need, urged planning on a national scale and, more than that, a national effort to put plans into action.

Having suggested such planning in its first annual report of 1972, NACOA returned to the theme the following year. In pressing for "overview planning" NACOA wrote:

> What NACOA finds lacking is pace, more than direction. Some of the right things are being done, but only some and not quickly enough. Coastal matters are being worked out, but only at a snail's pace. International matters are being worked out, but as if avoidance of conflict were itself a victory. Meanwhile the fish stocks slip, the young men go into other work, and as a Nation we import most of the fish we eat. What we do have to find out is whether we will or will not do something about it.

Now, with the National Plan before it and a decade in which to prepare for the longer future, the Nation should indeed find out what it is willing to do for its marine fisheries.

Implementation Is the Next Task

Phase 1 of the National Plan is a statement of general policy incorporating recommendations that are subject to review and acceptance before implementation goes forward. The plan stands as a document about which the Nation can mobilize thought and action. Phase 2, implementation, is a separate task, and the bigger one.

The plan contains no guidelines or timetables for implementation of its recommendations. The decision on this score was a deliberate one. So many possible actions are interdependent, so many interests are involved, and so many entities have parts to play that it was considered inappropriate to try to prepare at this stage what really would be a detailed implementation plan.

Determining the course of implementation thus remains the next step. The NMFS, in ways suggested hereafter, will be instituting preliminary actions to do this. Meantime, all those persons who contributed their thoughts and experience to the creation of the plan—all those most directly concerned for the future of the marine fisheries—are considered ready to help determine the shape and time of implementation. Such strength is itself a resource.

The Process of Implementation

Implementation must be geared to the necessities. It must have pace, as NACOA suggested. Implementation does not mean, however, that actions will go forward all at once on all fronts. In many cases the first action simply must be the gathering of information upon which long term programs may be based. But primary needs must be sorted out and priorities established.

Implementation will be in some areas exploratory and evolutionary. However it proceeds, it will require new kinds of coordination at many levels, local, state, regional and national. It will present demands for decisions with regard to legislation, organization, program design and funding. It will require commitments on the part of industry and the states, and the support of all who are interested in conservation and in recreational fishing. The extent and speed of implementation will depend ultimately, of course, upon the weight given the plan by the Congress and the Executive Branch as they consider alternative requirements in the realm of the national priorities.

Actions Already in Progress

The pace of implementation will be affected by the outcome of several actions now in progress. These include:

1. The deliberations of the Law of the Sea Conference, which probably will be resumed in 1976.
2. The consideration by Congress of legislation establishing extended jurisdiction and authorizing a new fisheries management regime.
3. The studies by a NOAA task force of management requirements that will come with extended jurisdiction.
4. The studies by the interstate marine fisheries commissions under the "Eastland Resolution," Senate Concurrent Resolution 11 of the 93rd Congress. (The studies are expected to be completed late in 1976, when recommendations will be developed to "save the commercial fishing industry," as the resolution put it, and to respond to related questions including the needs of the sports fishing industry.)
5. The preparation by the Senate Ocean Policy Study group of a National Fisheries Policy which will relate to policies to be developed on the use of all ocean resources.

Elements Pointing Toward Success

The National Plan, as it is placed before the Nation, appears to have the elements and the force essential to successful implementation.

Efforts to assist or to plan for the Nation's fisheries are not new. Programs of the former Bureau of Commercial Fisheries and other agencies sought to improve the conservation and use of fisheries resources. The Fish and Wildlife Act of 1956 prescribed specific actions to aid the fisheries. The Fish and Wildlife Coordination Act, last amended in 1958, incorporated early, if limited, responses to the need to preserve fisheries environments. The record of efforts to strengthen the Nation's fisheries is a good one.

The record of achievement, however, is otherwise. Few of the programs approached the problem in sufficient breadth. The intent of legislation frequently was frustrated by insufficient funding. In some cases, plans were not carried to completion or were not implemented. The common result was failure to achieve stated objectives. Above all, there was no widespread commitment to action, no truly national resolve to follow through.

The National Plan builds upon this experience. But it also points to ways to make success possible. Surrounding it and implicit in it are forces such as these:

- The plan is broader than any ever attempted before, national in its goals and national in design.
- The plan, springing from the recommendations of NACOA, a Presidential advisory body, has a new flavor of determination to achieve, this time, action as large as the needs.
- The plan is intended to respond to the basic objectives of all segments of the marine fisheries field.
- The plan places heavy emphasis on comprehensive management in fisheries.

- The plan reflects awareness of the problems of legislation, authority, organization, and funding that have presented difficulties in the past.
- The plan is developed—as no other plan before it could be—upon the assumption that extended fisheries jurisdiction become a reality and that with such jurisdiction will come both new opportunities and new responsibilities.

To Put Implementation in Motion

The task of implementation being as large as it is, preliminary initiatives should come from the Federal level, in particular from NMFS, where certain basic steps can be taken within its present authority and means, while the policy and legislative deliberations proceed.

Undertaking these steps is appropriate to NMFS, which was at the center of activities during preparation of the plan. The most important will help lay the groundwork for implementation. They are:

1. Determining, in cooperation with all interested parties, the range and kinds of actions necessary to prepare for management of the fisheries under extended jurisdiction. This is a major staff effort already well advanced.
2. Making the preliminary studies and projections of what may be required, in implementation of the National Plan, in such areas as administration, program, legislation, authority, and probable cost. This also will be a specific staff effort conducted within the scope of present NMFS authority and budget.

Cost implications of the National Plan will be given close scrutiny in the preliminary surveys. Sound estimates of cost increases cannot be made until implementing actions have been set out in some detail, but increases will surely be necessary to support such an enlarged overall effort. It is estimated that present expenditures on marine fisheries by State and Federal Governments exceed $140 million annually. These and other implementing costs may eventually reach hundreds of millions.

In addition to its basic surveys the NMFS is preparing to carry out other actions, recommended by the National Plan or within the spirit of it, to advance preparations for implementation. Examples of these are:

1. Beginning comprehensive studies of needs and priorities in the area of fisheries development.
2. Moving to place fisheries data collection on a uniform nationwide basis.
3. Expanding the data base in the field of recreational fisheries.
4. Exploring possible new needs for the training of fisheries managers, scientists, and other professionals as such needs may arise under extended jurisdiction.
5. Outlining a national program to accelerate commercial aquaculture.
6. Supporting the marine fisheries commissions' studies under the "Eastland Resolution."

The Depth of the Commitment

Implementation of the National Plan requires a commitment larger and deeper than ever has been asked before in the field of fisheries. The NMFS will do all that it can within the limits of its authority and present means to prepare the way for implementation. Specifics as to the necessary new mechanisms, and the changes in organization and legislation required, will be examined in coming months. The NMFS will provide a core staff functioning under administrative and advisory arrangements still to be worked out. Guidance and consultation may involve a subcommittee of the present MAFAC or other means of obtaining broad management guidance.

In all of this, broad and consistent consultation is regarded as essential. Communication will be continued with the states, with industry, with commercial and recreational fishermen, and with all other elements of the national concern. The NMFS strongly urges that representatives of all such interests consider what actions they may take to help move the plan toward the national goals.

Properly supported—and given the commitment it invites—the National Plan may come to be regarded as marking a turning point in the history of the Nation's marine fisheries. But this will depend upon what follows, and the test should begin at the earliest.